DOCUMENT RESUME

ED 308 377 CE 052 801

TITLE Industry-Education Partnerships: Massachusetts Case Studies.
INSTITUTION Massachusetts State Dept. of Education, Quincy. Office of Community Education.
PUB DATE 87
NOTE 61p.
AVAILABLE FROM Office of Community Education, Massachusetts Dept. of Education, 1385 Hancock Street, Quincy, MA 02169.
PUB TYPE Reports - Research/Technical (143) -- Reference Materials - Directories/Catalogs (132)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Career Education; Cooperative Education; Cooperative Programs; *Corporate Support; Elementary Secondary Education; *School Business Relationship; *School Community Programs; *School Community Relationship
IDENTIFIERS *Massachusetts

ABSTRACT

This document consists largely of descriptions of 15 industry-education partnerships in Massachusetts, selected on the basis of their creativity; the range of partnership organizations and activity they represent; the diversity of students, teachers, businesses, and communities they affect; and their innovative and efficient coordination and administration. Appearing between an introduction and two appendices (one containing a model for partnerships and the other a list of resources for partnerships) are descriptions of these partnerships: Academy for Contemporary Technology; Acushnet Schools/Fairhaven-Acushnet Cablevision, Inc. Partnership; Andover Industry/Business/Community Education Collaborative; Dorchester High School/New England Telephone Partnership; Horace Mann School for the Deaf/Honeywell, Inc. Partnership; Lawrence School Industry Liaison Project; Massachusetts Future Problem Solving Program; Massachusetts Preengineering Program for Minority Students; New Bedford School-Business Partnerships; Newspapers in Education: Falmouth Public Schools/Cape Cod Times; The Oxford/Digital Connection; Peabody Educational Council; South Boston High School/Federal Reserve Bank/Gillette Company Partnership; Springfield Public Schools/Monsanto Company Partnership; and Worcester School-Business Pairing Project. The descriptions typically include the names and addresses of contact persons, background information, description of the area, program focus, management and coordination of the partnership, program components, and a conclusion. (CML)

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INDUSTRY-EDUCATION PARTNERSHIPS: MASSACHUSETTS CASE STUDIES

Developed by
Community Education Office

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The Commonwealth of Massachusetts
Department of Education

1385 Hancock Street, Quincy, Massachusetts 02169

Dear Colleagues:

Industry-education partnerships are rapidly gaining in stature as productive and effective vehicles for addressing the needs of schools and businesses. Educators, business people, and community leaders in civic and human service agencies are finding that they have a common interest in developing programs and opportunities that improve the school-related experiences of students, teachers, and administrators.

In Massachusetts, we are proud to be leaders in demonstrating the benefits of public-private sector collaboration. Partnerships in this state are resulting in improved educational programs for our students and more productive, better workers in business and industry. We are committed to expanding the awareness and effectiveness of partnerships and to helping partners find innovative new ways to work together.

Our students and schools are enjoying a renewal of spirit and purpose through the infusion of creativity and energy that school-business partnerships are generating. I hope that this publication, which has been developed to share some of the successful partnerships that exist in the Commonwealth, will provide you with ideas and enthusiasm for enriching your schools with new or expanded industry-education partnerships.

Sincerely,

Harold Raynolds Jr

Harold Raynolds, Jr.
Commissioner

Winter, 1987

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INTRODUCTION

Industry-education partnerships are developing across the country in response to the common interest that business people and educators have in the education of our young people. They are working to ensure that today's students have the tools and motivation to become the productive citizens and workers that will be needed in the next generation. School, business, and community partners are collaborating to ensure that students have a solid grounding in the basic skills — reading, writing, and arithmetic — and a clear understanding of the expectations of the world of work — reliability, efficiency, and productivity. These partnerships also are helping provide teachers and school administrators with the information, skills, and materials they need to improve the education in their schools.

Industry-education partnerships have been defined as collaborative ventures by schools, businesses, and community institutions that combine the complementary resources and responsibilities of the participants in mutually beneficial programs. These partnerships have received support at the national, state, and local levels of government. In 1981, President Reagan created a Task Force on Private Sector Initiatives which recommended the development of private-public partnerships to address education-related issues at the local level. Numerous other reports, books, and panels have suggested similar solutions to the problems that are facing educators, business people, and communities. At the same time, many schools, businesses and community organizations have found that partnership makes good sense. Partnerships have developed creative and cost-effective ways to identify and meet the educational and world-of-work needs of the community's students while providing the business community with an opportunity to address some of its human resource concerns as it demonstrates its interest in education and in the well-being of the community.

The Community Education Office of the Massachusetts Department of Education and the Extended Committee for Industry-Education Partnerships have been working for several years to promote awareness of partnerships and of the strategies that have contributed to partnership success. They have collaborated on *Industry-Education Partnership Guidelines*, available through the Department, which provides assistance with initiating and maintaining a relationship in which the partners work together on the planning, programming, implementing, and evaluating of projects that address their major educational concerns. The Extended Committee also has developed a *partnership model* that can be used as a tool for starting, redirecting, or describing a partnership. This model, which can be found in Appendix A, provides the elements that are necessary to ensure that a partnership has a solid foundation and will endure the test of time.

This book is a companion to *Industry-Education Partnership Guidelines* and contains descriptions of fifteen industry-education partnerships in Massachusetts that demonstrate effective approaches to school-business collaboration. These programs have been selected for their creativity; the range of models for partnership organization and activity they represent; the diversity in student, teacher, business, and community populations that they impact; and their use of innovative and efficient mechanisms of coordination and administration.

As these partnerships indicate, there is no one partnership prototype. These collaborations have grown out of the specific concerns and interests of the students, schools, businesses, and communities involved. Working together over extended periods of time, partners in these relationships have come to understand each other and have developed programs that respond to the needs of the participating individuals and organizations. Many of these partnerships have experienced, at times, varying degrees of success due to a slow start, a plateauing of interest in year two or three, or a need to redefine their direction. Some of them also have found it necessary to adjust to changes in their economic and political climate. However, with a vision of goals they could accomplish and the benefits to be realized, these partners have committed the time and energy required to overcome these obstacles. As a result, these partnerships are demonstrating leadership in helping to make schools places where students enjoy learning, expand their potential, and prepare for the challenges of the next century.

We hope that these partnerships will provide you with ideas and energy for initiating or expanding collaborative relationships in your schools and community. The contact people listed at the beginning of each case are excellent resources and can provide you with additional information. The Department of

Education, also, is ready to help you with technical assistance, consultation, referrals, publications, and encouragement. In addition, we are most interested in knowing about the partnership activity in which you are involved. Kindly share written materials on your programs with us by sending them to:

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ACADEMY FOR CONTEMPORARY TECHNOLOGY

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BACKGROUND

The Academy for Contemporary Technology serves students in western Massachusetts who live in Berkshire county. This county, which extends from Connecticut to Vermont and borders New York on the west, includes the cities of Pittsfield and North Adams and numerous small and rural towns. While the region relies heavily on tourism dollars, it also supports regional offices of national corporations, such as General Electric, Mead Corporation, and Beloit Corporation.

With the exception of North Adams and Pittsfield, all of the county's high schools and many of its K-8 schools are regional, bringing together students from several communities. The county has a student population of approximately 30,000, with the greatest concentration of students living in and around Pittsfield.

FOCUS OF THE PARTNERSHIP

The Academy is a county-wide collaborative approach to enhancing technological education in Berkshire county. It brings together representatives of business and industry, area high schools, and Berkshire Community College for the purpose of encouraging high school students to expand their understanding of and to pursue careers in the applied sciences. The instructional offerings of the Academy, which occur mostly in the context of student projects, are designed to supplement and enrich existing public school offerings.

ORGANIZATION AND COORDINATION

The Academy was initiated, in 1984-1985, in response to an expressed need of Pittsfield Public School educators for realistic projects for students who had talents in practical problem solving and in the design and repair of machinery. While originally conceived of as a partnership for the Pittsfield schools and area businesses, its success in the first year led to its expansion to northern and southern county high schools and industry in 1986 and 1987.

Berkshire Community College (BCC) is the organizing agent of the Academy and its faculty, technology students, and specialized equipment provide an educational base for the partnership. The Director of the program is housed at BCC and oversees all of the Academy's components. Engineering and science faculty from BCC have been actively involved in assisting students, high school faculty, and business representives in project development and also have recruited their most able students to serve as aides on some projects.

A Board of Directors, composed of representatives of Berkshire Community College, the public schools involved, and businesses, provides guidance for the Academy. This Board, which meets three times during the year, sets policy for the Academy, oversees the program's financial status, and hires the Director. Following its expansion to all of Berkshire county, the program was divided into central, north, and south county components. Each regional component has an Advisory Committee composed of parents and representatives of BCC and of the schools and businesses in that area. These Advisory Committees meet every two to three months to review the program and to provide information assistance in support of ongoing or planned projects. Funding for the Academy has averaged $60,000 in each of its three years and has come from a grant from the Massachusetts Board of Regents of Higher Education.

PROGRAM DESCRIPTION

Groups of high school students meet with Project Leaders to undertake projects that address specific timely, important, and real needs. These projects have included building a robot, developing a computerized data base for tracking hazardous chemicals, and devising a communication system for disabled students. Projects extend over the course of one or two semesters in the winter or over a more intensive period in the

summer. Most projects meet in after school hours, often in time for students to make the "late bus," an important consideration at regional schools.

The Academy uses a variety of strategies to develop the technologically-based problems that become the basis of projects that are undertaken by teams of students, teachers, and business representatives. These "problems" frequently emerge while the Director of the Academy is recruiting teachers, business people, and BCC faculty and students to the program. Pamela Ledoux, Academy Director, initiates the process with visits to top administrators and staff in high schools, businesses, and community organizations. These meetings often combine explaining the program, identifying individuals' areas of interest, and "brainstorming" potential project ideas. Individuals who would like to participate in the program are invited to submit a short proposal for an area of investigation. The Academy staff determines the projects it would like to sponsor and requests budgets for the proposals that are accepted. The Director then assesses the degree to which the Academy's budget can provide the equipment and materials that the projects will require. She also works with proposal developers to evaluate their needs and research other sources of funding. Project leaders also develop weekly curriculum plans which indicate the learning and activity goals of each session.

Project leaders who are high school teachers or BCC faculty are paid $20.00 per hour for their time, which usually includes directing the project for a weekly two or three hour session over a period of ten to twelve weeks. Leaders from businesses are not paid as they generally meet with their project groups during business hours. The Academy has found that businesses have been very receptive to allowing interested employees release time for these projects. Project teams meet at area high schools and at business sites, depending upon the availability of the needed equipment and technology.

Once projects have been determined and staffed, students are recruited to participate in the projects. The Academy has found that it is more successful in attracting students to projects that have an immediate timeframe. The Director contacts superintendents, principals, and guidance counselors for recommendations of potential students. She also makes presentations on the projects and the program to groups of students at schools. She matches students who apply to the program with the appropriate projects, based primarily on the students' prioritized ranking of their interest in specific projects.

PROJECT OUTCOMES

In its short history, the Academy has supported several projects that have developed "real world" applications of major proportions. The Bear Proof Food Container Project has developed a product that was examined by the Superintendent of the Denali National Park in Alaska in the Summer, 1986. Based on his interest in the container, negotiations regarding producing it in large quantities are presently underway. An off-road vehicle that the Interdisciplinary Project modified for use by forest rangers has proven more satisfactory than any existing vehicle and may have its modifications patented and manufactured commercially.

Other projects that were undertaken in 1985-1986 have included:

- **Aviation in the 1980's,** which included lectures on aviation, two hour flights, and an introduction to the design, building, and flying of radio-controlled models.
- **Bridge Building,** in which students obtained hands-on experience in mathematics and physics plus exploratory experience in architecture and civil engineering through designing, building, and testing individual bridges.
- **Communications,** which gave two groups of students an opportunity to build a working AM radio station and work on a commercial grade satellite system for permanent operation.
- **Programming a Robot,** in which students, after debugging and testing Hero I (assembled by students in the previous year), used the Robot for solving engineering problems.
- **Building and Programming a Mini-Robot,** in which students built and programmed Memocon Crawler and presented robotics to 5th and 6th graders at their school, robotic manipulation to 8th graders, and advanced programming to industrial arts 11th graders.
- **Environmental Applications,** which, in two different projects, has explored the science of testing waste water and, on paper, has designed a water treatment plant for the Housatonic River.

Many students have reported on their projects to their schools' student body, to their individual class, or to classes in other schools. In addition, a videotape of some of the Academy's projects has been shown on local cable television, serving to increase the awareness and understanding of the program and to expand the opportunities available to Academy students. The teachers in the projects have found that they have developed, through their contacts with industry and the project, new levels of expertise that they have been able to incorporate into their own classroom instruction. Industrial project leaders have had an opportunity to expand their planning and management skills, enhance their communication skills, and, in some cases, recommend product development to their companies.

FUTURE PROGRAM GOALS

Having expanded to some of the high schools in north, south, and central Berkshire County in 1986, the Academy hopes in 1986-1987 to involve all twelve high schools in the county and to open its projects to seventh and eighth graders. Eighty-three students participated in the Academy in 1985-1986 and it is expected that this number will reach 120-130 in 1986-1987. Also, with expansion to the north and south counties, the Academy expects in its third year to bring five or more new industries into the program and to expand the number of teachers and BCC staff.

The Academy Board of Directors and staff also would like to expand the program to include students who are interested in exploring relationships between technology and other fields, such as physics and music, art and the sciences, and in other ways to expand students' perspectives on technology. They also hope to increase their ability to attract donations and other funds to the program so that they can continue to support the range of creative ideas that are proposed.

CONCLUSION

The Academy has found a vehicle for expanding the school day and increasing students' excitement with learning through projects that involve them with adults in problem solving on a major scale. This partnership allows students, teachers, Berkshire Community College, area industry, parents, and other community representatives to learn from each other while contributing to the quality of life for individuals, for their communities, and, potentially, for society at large. While obstacles such as geography, distance, and limited industrial resources exist in Berkshire county, the enthusiasm for this program and its tangible results are enabling it to grow in size and scope. In addition, it is increasing its ability to impact other students in the participating schools as project participants share their knowledge and experiences and as teachers adapt their project curriculum to their classrooms. The Academy is offering a creative approach for building on the technological expertise in its community to expand students' understanding of the practical applications of math and science.

ACUSHNET SCHOOLS/FAIRHAVEN-ACUSHNET CABLEVISION, INC. PARTNERSHIP

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Lorraine Daniel, General Manager
Fairhaven-Acushnet Cablevision, Inc.
360 Washington Street
Fairhaven, MA 02719
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DESCRIPTION OF THE AREA

Acushnet is a small town of approximately 9,000, located in the Southeastern section of Massachusetts on an inlet off of Buzzards Bay. The business community of this coastal town is composed of small commercial, shipping, and industrial manufacturing enterprises. Approximately 900 students are served by the Acushnet elementary and junior high schools. These schools feed into a regional high school which serves the New Bedford, Fairhaven, and Acushnet area and is located in Fairhaven.

PROGRAM FOCUS

The Acushnet elementary and junior high school/Fairhaven-Acushnet Cablevision Partnership is focused on increasing school and community access to information and video technology while increasing educational opportunities in the schools. The partnership assists the schools in raising the technical awareness and capability of students and local citizens by providing "hands on" learning experiences in video programming and technical operations. It also provides opportunities for the schools and citizens to plan programs for broadcast on the cable company's station.

ORIGIN OF THE PARTNERSHIP

As early as 1982, the Acushnet Schools investigated the possibility of collaborating with a cable franchise to make cable television part of the educational program. The schools were seeking mechanisms for expanding educational opportunities for their students and teachers. Concurrently, Fairhaven-Acushnet Cablevision, like other cable franchises, was interested in expanding its business in the community by establishing additional studios. Fairhaven-Acushnet Cablevision Company is the major cable franchise in the Acushnet area and serves approximately 6000 homes and about 70% of the 20,000 people living in the New Bedford, Fairhaven and Acushnet area. The success of this business depends largely on the favorable image it gains by broadcasting programs which address the informational and entertainment needs of the Acushnet community. The marriage of the cable company and the schools had the potential for providing the schools with new learning opportunities and technical training in video programming and providing the cable company with visibility among the teachers, administrators, school committee, parents, and students.

Because several cable companies expressed informal interest in the Acushnet proposal, the schools requested bids for site development. Fairhaven-Acushnet Cablevision was awarded a contract to establish a studio in the elementary school and provide technical training and assistance with program planning and equipment operation for both students and teachers.

STRUCTURE OF THE PARTNERSHIP

The school administrator and the cable television program director, along with staff members at the school and interested community members, form the operational decision-making structure of the partnership. The cable company is responsible for the transmission of programs from the school site and absorbs the cost of these operations. No additional staff from the cable company or the schools is required to put this partnership effort into operation. There is no formal advisory group linked to this partnership but community, staff, and student input is encouraged and received regularly. The superintendent and the cable company's program director meet on an informal but frequent basis to plan and produce programs which will be televised from the school site.

MANAGEMENT AND COORDINATION OF THE PARTNERSHIP

Fairhaven-Acushnet Cablevision has, with the assistance and cooperation of the elementary and junior high schools, established a program which utilizes all available school and cable company resources. Installation, utilization, and maintenance of cable equipment is managed by the cable company's program director and his staff. Program and production of video products are coordinated by the schools' head administrator. The director of the cable company is available as a consultant to provide technical assistance.

SPECIFIC PROGRAM COMPONENTS

The partnership has developed several activities which comprise the elementary and junior high cable television program.

Training

Fairhaven-Acushnet Cable Television Company provides formal and informal training and instruction for individuals who desire to learn the theory and practice of cable television/video operation. A three-credit course in video is provided for staff members at the elementary and junior high schools on a formal basis and in-house "hands on" training and consultation are provided as needed for both students and teachers.

Community Service

The cable site, established in the elementary school, is used by the superintendent, students, and teachers to broadcast school related programs and announcements to the community. Through a special computer hook-up to the main cable terminal, the students have broadcast access to the approximately 6,000 homes in the Acushnet area. The viewing community receives, on a daily basis, information such as school menus, a calendar of events, and notices of special meetings from the superintendent.

In-House Programming

The cable facilities are used by students and staff to enhance and enrich the regular educational program. While learning to operate the highly technical equipment, the students have taped plays, special lessons, and other artistic and academic events for sharing with other classrooms and, in some cases, with schools in other states.

CONCLUSIONS AND IMPLICATIONS

In its first full year of operation, the partnership has made its mark on the community. Students, parents and the community have benefitted from cable programming and the partnership has proven to be a tool for communication and for learning. It has provided a range of career related experiences for students and enrichment opportunities for the citizens. This partnership looks forward to expanding its programming as it continues to meet the needs of the community. In addition, based on this successful experience, the schools are exploring partnerships with other community businesses.

ANDOVER INDUSTRY/BUSINESS/COMMUNITY EDUCATION COLLABORATIVE

CONTACT:
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Andover Public Schools
Anns Lane
Andover, MA 01810
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DESCRIPTION OF THE AREA

The Andover Industry/Business/Community Education Collaborative involves representatives of the Andover School System, eleven businesses or business organizations, a hospital, a human service agency, two colleges, and the Andover Parents' Advisory Council. The Collaborative serves the town of Andover, which includes affluent residential neighborhoods and a business community composed of retail enterprises and burgeoning high technology companies.

PROGRAM FOCUS

A primary goal of the Andover Collaborative is to provide students and staff with assistance in career awareness and educational planning. A reciprocal goal is to provide local industry and community members an opportunity to get involved in and share some responsibility for the education of Andover youth. Although the Collaborative mainly sponsors programs that are related to students' career development, its efforts also include solving educational problems that effect the entire school system, such as the acute shortage of computer equipment.

ORIGIN OF THE PARTNERSHIP

The Collaborative grew out of a federally funded career education program, Project Discovery, which began in Andover in 1981-1982. This program started in Andover's West Junior High School and had, as one of its main goals, the establishment of an ongoing collaborative vehicle which would continue after the grant had ended and would assist the school with its career related activities.

The Collaborative was initiated in January, 1982 by the Coordinator of Project Discovery, who was a guidance counselor in the school system. The Coordinator sent a letter to local business people asking them to attend hour long monthly meetings from January through May, 1982. The invitation spelled out the goals of the planned collaborative:

1. to develop and coordinate contacts for career resources
2. to develop sites for shadowing experiences
3. to enhance the exchange of information between constituencies so that the world of work would be more accurately represented in the schools

Eight to ten business representatives and key Andover School System administrators attended the first meeting. Representation from business remained relatively stable during the first year and the Assistant Superintendent continued as the liaison person from the school system. Meetings in the first year generally consisted of reports and brief evaluations of the career related programs that had been initiated through Project Discovery. Many opportunities arose to include Collaborative members in some of these programs.

The continuation of the Collaborative into the second year was contingent on securing financial support for the Coordinator's position, which was funded through a second grant for the 1982-1983 school year. This second grant, however, required that Project Discovery activities target Andover's high school population. Goals for the second year included matching secondary level academic departments with appropriate people in companies in an effort to expand the career development activities. The representation from industry remained relatively stable throughout the second year with seven to twelve business representatives attending meetings and becoming a core group of interested participants.

Because grant money for Project Discovery was not found for the 1983-1984 school year, the school department funded the continuation of the Coordinator's position on a part-time basis in order to support the existence of the Collaborative. The costs associated with the Collaborative, such as the programs and operations, were absorbed by the schools and by the businesses involved.

STRUCTURE AND MANAGEMENT OF THE PARTNERSHIP

The Collaborative has no formal charter or requirements for membership, although it does have a statement of policy. It remains a relatively stable but informally organized group of interested school, business, and community leaders who cooperate on a voluntary basis. Commitments are minimal with only the expectation that members attend regular meetings and actively contribute to task forces. Additionally, some members also participate as speakers or resources for special programs.

Representatives from business and business organizations attend monthly Collaborative meetings from 7:30-9:00 a.m. at a school location. The business members represent all levels of decision making within their home organizations and are from Andover based businesses or are parents of children in the Andover School System. School representatives consist of the Project Discovery Coordinator, the principals, some guidance counselors, and the high school program advisors. Although the Assistant Superintendent has left the school system, another representative from the Superintendent's Office has been assigned to the Collaborative. Discussion has often centered aroung the optimal size for the group. While the Collaborative officially lists 36 members, attendance and activity reflects participation mainly from seven to fourteen businesses and other organizations.

At this time collaborative meetings are jointly run by the former Coordinator, who is now the Academic Counselor, and the Assistant Superintendent. These co-coordinators are responsible for setting the group's agenda and have created task forces that take an active role in accomplishing specific goals. These task forces set their own objectives and schedule of meetings. The Collaborative as a whole, therefore, meets less frequently and uses its meetings to share reports from the task forces and continue dialogue among the Collaborative membership. The task force and large group meetings alternate monthly, which keeps each member's commitment to approximately eight to twelve meetings a year.

The co-coordinators direct the activities of the Collaborative, play a facilitative role in meetings, and encourage consensus decision making. They hope that the Collaborative will develop into a community council in which equal responsibility for setting and accomplishing goals is shared by the school and the community constituencies. However, at present, the work of conceptualizing and implementing collaborative ideas and programs rests with the coordinators. They also take responsibility for all internal and external communication regarding the Collaborative.

SPECIFIC PROGRAM COMPONENTS

The Collaborative was organized with a focus on career awareness and educational planning for students and faculty. Much of its programming reflects this focus although some of its task force work has targeted larger educational problems that have emerged in the school system. This brief report on the efforts of the task forces over the last few years reflects the breadth of accomplishments of the Andover Collaborative.

Career Awareness Task Force

As 80% of the population of the Andover School System goes on to college, there is a heavy focus on career and educational decision making by this task force. The task force assisted with the planning of several of the following programs and provided human and other resources for all of these programs:

1. Academic department career days with over 100 speakers in math, science, social studies, English, foreign language, business, and industrial arts
2. Career options panel for girls focusing on non-traditional roles
3. "Choice, Not Chance" sessions on educational planning/career choice which were integrated into the curriculum for all juniors, with corollary programs for parents
4. Career development workshops
5. College admissions workshop
6. College admissions workshop for special needs students
7. Skills Day workshops on training options presented by fifteen businesses and community organizations

Community Visiting Day Task Force

This special event was aimed at opening the school doors to the community. Business and community leaders received special invitations to a morning program which included attending high school classes and a question and answer session on the Andover School System. Collaborative members were keynote speakers for the morning program.

Community Education Task Force

Last year's task force members successfully negotiated with the Town Council at Town Meeting a plan to earmark a special portion of the town budget to upgrade computer facilities in the school system. This computer equipment will also be available to Andover residents in after-school hours. This year the Computer Education Task Force developed recommendations on equipment purchases and is now preparing a proposal for a comprehensive staff development project in computer literacy.

Internships Task Force

The development of written materials for the internship program and the placement and monitoring of fifteen students in internship settings have been among the accomplishments of the Internship Task Force.

Excellence Task Force

Andover High School's performance in relation to current recommendations for achieving excellence in American schools was reviewed by this task force. Also, newspaper publicity generated by the task force about the accomplishments of Andover students and the Collaborative helped to strengthen the image of the Andover schools.

In addition to task force accomplishments, the networks formed in the larger Collaborative meetings have yielded benefits. Some of these benefits included:

1. A two session workshop for program advisors and administrators on quality circles
2. Site visits to organizations participating in the Collaborative
3. A six week "Project Business" unit conducted in the junior high
4. Job placements for students

Instructional Modules

In 1985-1986, a significant goal of the Collaborative was implemented through the development of instructional modules on "life problems" that were introduced in classrooms throughout the system, K-12. These problems, which have required critical thinking skills in their solution, have included topics such as the Massachusetts seat belt law and putting a space station into orbit.

CONCLUSIONS AND IMPLICATIONS

The Andover Collaborative has accomplished a great deal in its five year history. It has demonstrated "staying power" and commitment from a core of business and community members, flexibility in its ability to alter its operating structure to better accomplish its goals, and creativity in improving existing programs and generating new ones in response to the needs of the students, staff, and the community.

However, there are several issues that the Collaborative has been struggling to resolve. In order to function collaboratively, it needs to develop a stable-sized group of from 10-20 members who will help to plan and implement the collaborative's activities. It also needs a larger network in order to have a broad base of resources on which to draw for its programs. Funding has also been an ongoing concern for the Collaborative, with members not able to reach resolution on guidelines for members' financial obligation to the partnership. Members are researching alternative organization structures that will address their unique situation and funding mechanisms that will be appropriate to the Collaborative and its goals.

DORCHESTER HIGH SCHOOL/NEW ENGLAND TELEPHONE PARTNERSHIP

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BACKGROUND INFORMATION

Dorchester High School, located in the Dorchester section of Boston, is a "district school" within the Boston Public School system. This system has "exam schools" which require examinations for entrance, "magnet schools" which specialize in specific areas such as the arts or sciences, and "district schools" which offer diverse programs and accept city students who do not go to the exam or magnet schools.

Dorchester High School's student body of 760, like most inner-city schools, is composed of a high percentage of minority, bilingual, and special needs students. With 84% minority students, this school has a "reverse segregation" situation. In addition, Dorchester High School has, at 27%, the second highest special needs population in the city.

New England Telephone was the first business in Boston to invest in a long-term relationship with a public high school. Its relationship with Dorchester High School dates to 1969 and was the model for the Tri-Lateral Council, which was established in 1974 as a result of the court-mandated desegregation order to oversee school-business partnerships with Boston high schools.

FOCUS OF THE PARTNERSHIP

Dorchester High School has suffered from a negative self-image, based in part on its poor ranking in academic standing and low morale among its teachers, parents, and students. In order to upgrade its curriculum and improve its negative self-perception, it works with New England Telephone on a range of activities that are designed to upgrade the academic program; encourage student attendance; decrease the dropout rate; promote parent and community involvement in the school; and instill school pride. New England Telephone's investment of human and physical resources in this school gives it an opportunity to contribute to the development of youth in the city with the understanding that the benefits that accrue to the city will also accrue to New England Telephone.

STRUCTURE AND MANAGEMENT OF THE PARTNERSHIP

While the partnership relationship has evolved gradually over its 17 years, in the past three years it has grown significantly. This success is in part due to the planning process that was required of all school-business partners in the Boston Compact, an agreement in which the business community agrees to provide jobs to graduates of public high schools and the schools are accountable for setting and meeting measureable goals.

New England Telephone had always had a designated coordinator who has overseen the partnership relationship and worked with the headmaster on a series of discrete programs. Often this involvement meant providing funding for career awareness programs and for special events, such as the Closeup program which brings students to Washington, D.C. to observe government in action. The identification of needs and planning of programs were often done by the school headmaster and New England Telephone in a "top down" manner.

In recent years, the partnership coordinator position has become a three-year assignment in which the incumbent works closely with the headmaster and school personnel to identify needs and develop long and short term goals and programmatic responses. Joanne Harrington, the New England Telephone partnership coordinator, presently spends about 90% of her time at Dorchester High School. Working with Stanley Swartz, Headmaster, William Fitzgerald, the school Development Officer, and Ann DePlacido, the University of Massachusetts/Institute for Learning and Teaching higher education liaison to Dorchester High School, she oversees, implements, follows up on, and trouble-shoots the numerous activities that the partnership has brought to the school. Also, the Boston Compact's requirement that school planning address four specified areas and involve teachers and administrators has benefitted the partnership as it has increased the involvement of the school community in its planning. In 1985-1986 department heads met with their faculty to determine their needs and brought these priorities to planning team meetings with Swartz, Fitzgerald, Harrington, DePlacido, and representative school administrators, teachers, parents, students and members of the community.

In April, building on this "bottom up" approach, the planning team met to review the system-wide goals identified by the Boston Compact and to develop goals specific to the high school. Using planning strategies developed with New England Telephone's guidance in the previous year, it wrote a two year school improvement plan with four sections that addressed:

- improving school climate
- improving academic achievement
- improving graduate placement
- increasing parent and community support

The partnership coordinator, the school's Development Officer, and the liaison person from the University of Massachusetts met frequently to design and plan responsive programs and activities for students, teachers, and the school community, calling upon the headmaster and department heads as needed. In addition, they determined the resources of each of their institutions that could contribute to these programs, taking into consideration people, materials, expertise, and financial support.

SPECIFIC PROGRAM COMPONENTS

New England Telephone provides educational support, in-kind donations, and financial support through a variety of programs that it plans, implements, and evaluates with personnel from Dorchester High School to meet the needs of the students, teachers, administrators, and parents of the school.

Educational Support

- The partnership coordinator from NET is a member of several advisory councils, committees, and collaboratives of the school and acts in an advisory capacity to most departments of the school on issues such as curriculum and staff development and school planning.
- Company staff serve as mentors and tutors for students, guest speakers in classes, curriculum developers, and provide technical assistance with projects, such as the development of electronic equipment for inter-and intra-school math competitions.
- In the past three summers, 150 students from the Boston public schools have been given summer jobs by NET, with 99 of these students coming from Dorchester High School.
- In the summer of 1985, sixty students participated in job preparation workshops that included job search skills, resume writing, completing job applications, interviewing, and a workshop on grooming.
- Parent outreach activities, such as the Freshmen Parents' Breakfast and Parent Open Houses, are held with the assistance of the NET Coordinator.
- Efforts are underway, through the interest of company employees, to revive the alumni association and to develop a "Friends of Dorchester High School" association.
- The NET coordinator has helped to expand the school's public relations through developing press releases on its activities that are sent to local newspapers.

In-Kind Donations

- NET gives donations or otherwise supports several programs that benefit the school: Junior Achievement; Urban Scholars, an enrichment program at the University of Massachusetts; Reading is Fundamental; MASSPEP, a pre-engineering program for minority students; and other scholarship programs.
- The company provides the printing for students' and teachers' manuals, curriculum materials, and special projects.

Financial Support

- NET sends several students each year to Closeup, a one-week political studies program in Washington, D.C.
- Curriculum materials and magazine subscriptions are purchased for the school.
- The company pays for incentive and achievement awards, certificates, and gifts given to students for academic, citizenship, and attendance accomplishments.

Investing in Excellence/Keys to Excellence

Many recent changes have taken place at Dorchester High School: new curriculum objectives; a new promotional policy; and new courses of study and standards for graduation. Because of these changes and the morale problems that teachers had suffered in the past ten years through desegregation and teacher layoffs, NET offered a generic motivational course at its Learning Center in Marlboro. This course, "Investing in Excellence," is a self-awareness experience that helps individuals discover and share insights, concepts, techniques, and skills that allow them to grow and develop their potential. Twenty-five administrators and faculty members from Dorchester High School attended this program at the Learning Center and found it increased interest in curriculum development and improved teachers' attitude toward school.

In 1985-1986, almost 80% of the student body participated in "Keys to Excellence," a young adult version of this goal setting and motivational program. Teachers were trained to present this program and used video-tapes and practice exercises to deliver the material.

Minority Management Association

NET's Minority Management Association, composed of minority employees, has played an active role in supporting the Dorchester High School partnership since 1984. Association members have served as "buddies" to summer employees and have tutored these students during the school year. In addition, this Association has given, in the last few years, scholarships to graduating seniors.

CONCLUSION

Dorchester High School/New England Telephone Partnership has several measureable outcomes that demonstrate the success that it has experienced in the past three years. The school is proud of its improved test scores, reduced dropout rate, higher attendance percentages, increased post-secondary placements, and the rise in parent and community participation in the school. In 1982, Dorchester High School placed 16th out of 17 Boston high schools in academic ranking. Today, with assistance from New England Telephone, it has risen to 12th place in math, 15th place in English and 7th place in attendance rankings.

This partnership demonstrates a multitude of ways in which schools and businesses can collaborate and the management and planning strategies that business people can share with schools. Now that teachers, students, parents and the community are involved in the need identification process and in exploring resources for addressing these needs, it can be expected that this partnership will expand into additional areas of student concern. It is presently involved in collaborating with human service agencies to address the "out of school" needs of students and is putting in place programs and services that will support students, such as those who are pregnant or parenting, in order to help them maximize their school experience.

While the programs and projects of this partnership are impressive and have contributed significantly to the quality of individual students' lives and the climate in the school, its most important progress has been in its ability to help Dorchester High School develop a process for planning. Joanne Harrington says that she hopes the school will "institutionalize planning" as a way of doing business with the school. New England Telephone is not interested in diminishing its role in providing resources for the school but it would like to see the school continue to build upon and expand the planning mechanisms it is so successfully developing.

HORACE MANN SCHOOL FOR THE DEAF/HONEYWELL, INC. PARTNERSHIP

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BACKGROUND INFORMATION

The Horace Mann School for the Deaf, the oldest public day school in the United States, was founded in 1869 as a school for the "deaf and the dumb" and boasts as one of its early students, Helen Keller, and Alexander Graham Bell as one of its former teachers. Today a unit of the Jackson Mann School, it is located in a section of Boston called Allston and serves 187 hearing impaired and multiply handicapped students from grade 3 to age 22.

Honeywell, Inc., a high technology firm with its headquarters in Minnesota, has numerous plants in Massachusetts. The Brighton plant, which manufactures and assembles computer components, is located on the Allston-Brighton border and employs over 1100 individuals.

ORIGIN OF THE PARTNERSHIP

In 1977 Lou Bianchi, Coordinator of the Horace Mann Middle and High School, decided to act on his growing recognition that the school needed to do more to help students achieve success in competitive employment situations and develop the income-producing skills and attitudes that would allow them to live independently. He approached neighboring businesses to determine if they would collaborate with the school by providing hearing impaired students with part-time work during the school day. At Honeywell, Bianchi met with David Gosselin, the plant manager, who listened cautiously and suggested Bianchi come back in a few weeks. Bianchi persevered and, shortly thereafter, one student began a part-time work placement at Honeywell.

Gosselin delegated the Horace Mann project to Fred Miola, the production manager, who, with Bianchi, recognized the potential for this project. Appreciating the need for hearing-impaired students to learn job-related new skills in the protective and familiar environment of their school, with people who were accustomed to working with them, Honeywell agreed to establish a training classroom at Horace Mann. The school-based training center was successful in preparing the group of students who next worked part-time at Honeywell and the fledgling partnership was launched.

COORDINATION AND MANAGEMENT

Lou Bianchi and Fred Miola, and more recently Miola's successor as Partnership Coordinator, Richard Pierpont, conceptualize, design, plan, and collaborate on the implementation of the partnership programs, whether for students, school staff, or company employees. Joel Beck, currently Director of Brighton Operations for Honeywell, and his superiors are kept informed regularly about the activities of the partnership and Beck participates in some of the initial discussions for new programs. Miola and Pierpont have scheduled work placements within the company and helped to coordinate training and consulting activities on hearing-impaired issues that school staff provide for company employees. Bianchi collaborates with the headmaster, teachers, counselors, and other school staff to select students for the programs, develop training activities, provide support for the students in the programs, and design sensitization and awareness-raising programs for school staff and company employees.

SPECIFIC PROGRAM COMPONENTS

Partnership activities are aimed at giving students the skills and work experience they will need to gain and retain positions in industry. In addition, activities are planned to provide awareness, sensitization, and skills for Horace Mann and Honeywell employees who are involved with the students through the partnership. Students, who generally are 17 to 22 years of age, are prepared for and placed in several different areas of Honeywell's operation, including the clerical, assembly, maintenance, electronics, and dispatcher departments. Following training at Horace Mann in a related vocational area, students spend four hours a day in classes and four hours working at Honeywell. Most of these students also work at Honeywell fulltime in the summer.

Students entering the work phase of the program experience the same entry procedures as any other Honeywell employees. They complete an application, are interviewed, and receive an orientation to the company's policies. They also are warned and disciplined with the same procedures as other employees, providing them with a realistic understanding of the requirements of the workplace, especially in the areas of attendance and productivity. While most students have had exemplary attitudinal records, a few have been "fired" and were not allowed back to work until they had received additional training and supervision at school.

School faculty have received training on Honeywell's procedures at the company site so that they are able to prepare students appropriately for their work experiences. Through working at Honeywell, teachers also are able to bring back to the classroom information on the culture and expectations of the company, further enhancing their ability to prepare students for the workplace.

Honeywell recognized from the outset that it needed to prepare its workforce and workplace for the introduction of hearing impaired employees. In one of the first summers of the program, it hired a teacher from Horace Mann to help sensitize managers and workers to the special needs of the hearing impaired. This consultant developed workshops on the emotional needs of these students, safety considerations, and communication problems. Honeywell instituted a buddy system that serves to ensure that hearing impaired employees are aware of auditory warnings, such as for fire evacuation, and provides "signing" for informational meetings. Honeywell also has introduced into the plant TTY telephones for the hearing impaired and a blinking alarm system for the lavatories.

As new technologies and procedures are introduced at Honeywell, or students at Horace Mann develop the ability to enter new areas of the company, teachers are trained and prepared for imparting the required skills to the students. In one case, in an especially sophisticated technological area, a Boston University engineering student was trained in the new procedures and taught them to the Horace Mann Teachers. In addition, the program has been expanded to include the multiply handicapped. Building on their three-way relationship, Boston University, Honeywell, Horace Mann personnel have developed curricula and training experiences for four multiply handicapped students at Horace Mann. These students, with a teacher, an aide, and a peer counselor, are learning job-related skills at the Brighton plant.

OUTCOMES

Honeywell presently has 30 hearing impaired employees, 26 of whom have graduated from Horace Mann and were trained at Honeywell through the partnership program. The other four employees came "off the street," but knew of Honeywell's receptivity to the hearing impaired through the deaf community. Honeywell has been very pleased with the reliability and work habits of its hearing impaired employees and has observed that they have become well integrated into the workforce. They have strong ties with the hearing employees and participate in the company's social and sports events. Honeywell has found that the introduction of these students and workers into the company has raised employee morale and pride in being associated with Honeywell. In addition, employees have become more sensitive to each other's needs and managers have found that they are more responsive to and patient with their units' concerns.

Horace Mann takes seriously its responsibility to provide students with the vital link that will allow them to make the transition from a sheltered school setting to living independently. The Honeywell partnership allows students to fulfill themselves by developing the skills and ability that will allow them to test the "real" world and to experience success. Honeywell provides resources, expertise, time, interest, experiences and encouragement that the school cannot replicate by itself. In addition, Honeywell's overall investment in the

school upgrades the morale of the teaching staff by demonstrating that these students have a future and that society cares what happens to them.

FUTURE PLANS

Honeywell is interested in understanding as much as possible about the Horace Mann students and their performance level. Presently, Joel Beck and other Honeywell executives have identified two areas of concern: Horace Mann students are not as productive as Honeywell believes they could be and these employees do not seek or take advantage of job improvement opportunities. Through teaming up with members of the Boston University School of Education faculty, Honeywell and Horace Mann staff will conduct a study to determine if there are particular variables that are uniquely affecting these deaf students' performance.

Honeywell also is continually investigating how it can "transport" this program to other Honeywell sites. The company has a long-standing and strong corporate commitment to community involvement and encourages and rewards creative and effective participation in the local community's well-being. The Brighton plant will be giving careful consideration to the transferability of this program and to the components that can be replicated in other locations.

LAWRENCE SCHOOL INDUSTRY LIAISON PROJECT

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DESCRIPTION OF THE AREA

The Lawrence School Industry Liaison Project involves the Lawrence Public Schools and industry in the greater Lawrence area. Lawrence, a moderately sized urban center in northeastern Massachusetts, has historically been a center for the textile industry. Heavy manufacturing industries and retail businesses characterize the area as does a growing base of high technology companies.

PROGRAM FOCUS

The goals of the Lawrence School Industry Liaison Project are 1) to provide students and faculty with the opportunity to learn the charting and management techniques that improve business productivity, 2) to apply these techniques in local industry, and 3) to develop a curriculum that would be implemented at Lawrence High School. The participating companies, while providing students with an opportunity to use these skills in the analysis of their companies, benefit from the information gathered through the student projects.

ORIGIN OF THE PARTNERSHIP

Three years ago, a Lawrence School System administrator, responsible for staff development, invited the Executive Director of Growth Opportunities Alliance for Greater Lawrence (GOAL) to speak at a staff development luncheon. GOAL'S Director described the creation of his organization, which had been developed through the cooperation of the Mayor's office and local industry. GOAL was based on the work of the noted statistician, Dr. W. Edwards Deming, who had recently assisted Malden Mills of Lawrence in its reorganization efforts. Deming's work began in Japan in 1950 and was instrumental in creating a revolution in quality and economic productivity. Deming received the Emperor's Medal and his image and name appear on the coveted annual productivity award, the Deming Prize. A large number of local companies were excited about Deming's approach and created GOAL to assist local industry and the City of Lawrence with revitalization through the use of these techniques.

After the luncheon, the Executive Director of GOAL, the school administrator, and a representative from the Superintendent's office began discussing the possibility of creating a cooperative project. An initial proposal for a program which involved students, faculty and local businesses was developed by GOAL and the school department. While GOAL representatives spoke to local business people and recruited four companies willing to participate, the school department representatives got support from the Superintendent and the faculty. Funding was sought unsuccessfully from state sources and eventually the cooperating organizations including GOAL, the school system, the City of Lawrence, and the participating industries agreed to fund the pilot project.

GOAL staff, representatives from participating industries, and school department staff met over the Summer of 1983 to plan the specifics of the curriculum to make the project a reality for the 1983-1984 school year. Interested faculty and company representatives were invited to work on the program design and, by September 1983, the curriculum and personnel were in place to begin Phase I of the two semester pilot project.

STRUCTURE AND MANAGEMENT OF THE PARTNERSHIP

Once the initial decision was made to collaborate on the project, an educational consultant was hired by GOAL to coordinate the industry side of the project. The Coordinator of Occupational Programs for the Lawrence School System handled the overall management for the schools. GOAL staff were responsible for brokering contacts with businesses, co-planning the program design, maintaining communication and liaison with participating industries, and evaluating the project. School staff were responsible for gaining

support and participation from faculty, co-planning the program design, recruiting and selecting students, and maintaining liaison with school administration. Both groups shared responsibility for the project's publicity.

INITIAL PROJECT COMPONENTS

Originally the Lawrence School Industry Liaison Project took place in two phases each semester. In Phase I, students and faculty participated in two hour classes held after school, twice a week for six weeks. These classes, taught by a team of high school teachers, were based on the work of Deming and focused on the use of statistical charting techniques and other methods of improving productivity in business. Class members learned how to collect data, interpret charts, and were given an orientation to a particular company site.

Phase II of the program involved a six week assignment in a specific company. Four greater Lawrence companies, Gould Programmable Control Division, Inc., Honeywell Lawrence Operations, Malden Mills, and Western Electric Merrimack Valley Works participated as pilot sites. Students were assigned to mentors who generally were management staff involved in employee training. These mentors were responsible for the orientation, job assignments, and ongoing supervision of the students. Additionally, faculty members met with students, both in school and at the job site, to assist them with their projects, and met with business mentors to discuss the students' progress.

The program was explained to students at class assemblies and all Lawrence High School students (grades 10-12) were encouraged to apply to the program. Students from other area high schools were also invited to apply. Selection criteria include math background, academic record, attendance, discipline, and recommendations from teachers. Applicants were interviewed by guidance counselors and a group of twenty students that reflected the cultural diversity of Lawrence and an equal proportion of male and female participants was selected. Students were paid the minimum wage by the participating companies for their work in Phase II.

The project was explained to all faculty in departmental meetings and twelve faculty were selected on the basis of interest. Interest exceeded the available number of slots which, in the first year, were filled with math and science teachers, a social science teacher, the director of guidance, and an assistant principal. The faculty members, who were paid a stipend for their involvement, were in most cases able to incorporate this course content into their own curricula and to develop significant relationships with their contacts in business. Also, some of the school faculty members became teachers in the classroom phase of the program.

Following the initial semester of the project, the school department identified the following areas for evaluation:

1. Student learning — a pre-test and post-test in mathematics administered to all students
2. Student satisfaction with the experience
3. Faculty response on the program and its ability to be infused into their curricula
4. Companies' evaluation of student skills and performance
5. Companies' evaluation of what they learned about their own company from student projects

These concerns were taken into consideration in each following year's planning for the project.

PRESENT STATUS OF THE PROJECT

One of the initial objectives of this project was to have it become part of the Lawrence High School regular curriculum and, over the years, to increase the numbers of teachers who incorporated aspects of the classroom activity into their course work. In 1985-1986, the material taught in the pilot project was taught at the high school as a math course, "Job Preparation Math Skills," that also included computer applications. Although the formal six week internship phase of the project is no longer a part of the program, the businesses continue to employ students who have taken the course in part time jobs. In addition, the businesses involved continuously evaluate the curriculum to ensure that it remains current and maintain close contact with the high school faculty.

CONCLUSIONS AND IMPLICATIONS

Support from the top level administrators, the Executive Director of GOAL, and the Superintendent of Schools created sustained interest and enthusiasm in developing this collaborative project. Many of the techniques taught in the project were new and had never been presented to high school students. The Lawrence School Industry Liaison Project broke ground in adapting this material for high school students and the adoption of its curriculum by the school system has represented a triumph for the project and demonstrated its value and relevance for students. In addition, the project initiated communication between the schools and GOAL, who are exploring additional programs on which they could collaborate and involve the business community.

MASSACHUSETTS FUTURE PROBLEM SOLVING PROGRAM

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BACKGROUND INFORMATION

The Future Problem Solving Program (FPSP) was developed in 1974 by Dr. E. Paul Torrance, Chairperson of the Creative Studies Department at the University of Georgia in Athens. He designed the program to teach children the creative problem solving process through practice, training and inter-scholastic competition. The competitive program began with 7 teams from local high schools and within 4 years had become a national competition, the National Future Problem Solving Bowl.

The program was implemented in Massachusetts in 1979, primarily through the efforts of Marinel Johnson, an educator and director of a Gifted and Talented program in Canton, Massachusetts. She solicited support from the Massachusetts Association for Advancement of Individual Potential, Inc. (MS/AIP) and from Honeywell Information Systems, Inc. Her proposal was accepted and the program was initiated in Massachusetts under the co-sponsorship of MA/AIP, the Massachusetts Department of Education, Office for the Gifted and Talented, and Honeywell, Inc.

OVERVIEW OF THE PROGRAM

The Massachusetts FPSP is both a year-long curriculum project and a program of state and national competition. It is designed to use futuristic problems to teach problem solving skills to youngsters from grades 4 through 12. Students work in teams of four to solve a problem that is relevant to our future, such as the impact of robotics on society or the disposal of nuclear waste. Teams work with their coaches throughout the school year to develop solutions to three practice problems which are scored by evaluators who are employees from Honeywell, Inc. and educators. Performance on the third practice problem determines the selection of teams for competition at the Massachusetts Problem Solving Bowl, which is divided into three categories: Juniors (grades 4-6), Intermediates (grades 7-9), and Seniors (grades 10-12). The MFPSP is designed to accomplish the following goals:

- enhance the creative thinking abilities in students
- stimulate young people's knowledge of and interest in the future
- help young people increase their communication skills, both written and verbal
- assist young people to function more effectively as members of a team
- provide students with a problem solving model that can be integrated into their lives
- assist students to develop and improve their research skills
- help children to improve their analytical and critical thinking skills
- guide students to become more self-directed and responsible people

STRUCTURE OF THE PROGRAM

The MFPSP is extremely flexible and can be structured differently in different settings. Some teachers present it to the entire class as part of the curriculum and submit one or two solutions for each problem. Other school systems, especially at the junior high and middle school level, have teams which meet after school as part of an enrichment program for gifted students. Often parents or community members serve as coaches and arrange meetings in their homes in the evening or come to school to work with their teams. The program's flexibility means that a wealth of community resources such as retired persons, business people, parents and others can become involved in this challenging educational experience.

Student Preparation. The teams work on three practice problems throughout the school year, learning more about the process with each problem. By the time they have completed the third problem they have learned the entire process and are ready for competition in the state and national bowls. The problems for the 1985-86 program were drawn from the following themes:

- Endangered Species
- Feeding the World
- Artificial Intelligence
- American Legal System
- Organ Transplants

The problem is presented as a "Fuzzy Situation" (a problem with undefiend limits), such as how to control overpopulation. The students brainstorm the problem, divide it into subproblems, and restate the problem so they can focus on solving a specific aspect of it. They use brainstorming to generate alternative solutions, measure each solution against criteria, such as practicality or community acceptance, and determine a course of action which could solve the problem.

Students need to research these complex problems of the future before they can intelligently generate solutions. The national program publishes a resource manual each year which provides background information on the topic areas and lists and summarizes a range of books, periodicals, and articles that are particularly helpful to students who live in remote areas that are a distance from a library.

Coaches will arrange for speakers and field trips to help students explore and investigate the topics further. For example, teams in the Easton school district made field trips to the Massachusetts Correctional Institution/Walpole to study about prisons and a trip to the Polaroid Corporation to learn about the uses of laser technology in photography. Responses from the students, coaches, and field trip hosts reinforce the value of this experiential learning.

The Competition. Participation in the State Bowl is based on a team's performance on the third practice problem. On the morning of the State Bowl, the students are given the problem and a booklet in which to write the solution. They work in classrooms without their coaches and, at the end of two hours, hand in the solution to the evaluators who critique and score it. The teams then join their coaches to begin preparation for the Solution Selling Presentation, during which they try to sell their solution to the audience through a skit. The presentations are judged in the afternoon and first, second, and third place winners of the Solution Selling Presentation are selected. Winners of the problem solving process in each division are invited to the National Future Problem Solving Bowl, which has a format that parallels that of the State Bowl.

In addition to problem solving, the FPSP conducts competitive programs in Scenario Writing and Visual Arts. The Scenario Writing program provides individual students with the opportunity to exercise their creative writing talents and improve their communication skills. Students write a scenario on one of the problem solving topics which is judged by a special team of evaluators. The students who wrote the top ten scenarios in each of the three divisions receive an award for their accomplishment. The top five scenarios in each division are submitted to the national competition.

In the Visual Arts program, which also uses the problem topics as themes for its competition, students submit art projects that reflect their interpretation of the problem and a suggested solution. A school or school system may submit up to 25 entries which are displayed at the State Bowl, with awards presented to the winners in each division.

In the newest component, Community Problem Solving, teams of students identify problems in their community to which they then apply the problem solving process. Working with community officials and organizations, students have helped to bring small business to a community, clean up a river, and develop a fencing system to hold back sand dunes. Community projects have helped to promote community cooperation and to increase students' understanding of and appreciation for their communities.

Primary Division In 1984-1985, the program expanded to include a component for the primary division (grades K-3). Activities and materials have been developed for teaching problem solving skills to younger children in the classroom. These children work on problems that are relevant to their age group and do not participate in the competition.

MANAGEMENT AND COORDINATION OF THE PROGRAM

The MFPSP is managed by an all volunteer staff consisting of a state coordinator, an evaluation coordinator, a scenario writing coordinator, and a visual arts coordinator. Each coordinator has statewide responsibility for his or her specific component of the program.

Ann Hoyle, the state coordinator, is the primary contact person for the teams and the other coordinators. At the beginning of the school year she distributes information about all phases of the program, collects the registration forms and fees, and turns them over to the respective coordinators. She also coordinates training for the coaches in the Fall and provides them with resource material from the national program.

The evaluation coordinator recruits educators and business people who score and critique the problems. This coordinator organizes an intensive two-day training session to teach the evaluators about the problem solving process, the method used for scoring the solutions, and ways to analyze how a team used the process to solve the problem. Evaluators also are encouraged to critique the solution, providing students with suggestions for improvement and encouragement for their accomplishments.

RELATIONSHIPS WITH THE CO-SPONSORS

The staff of the MFPSP receives support and assistance for the program from its three co-sponsors. The Massachusetts Association for the Advancement of Individual Potential, Inc., a non-profit organization, is the major sponsor of the program. It closely supervises the program, provides the staff with support, assists with recruitment, and works behind the scenes at the State Bowl. The state coordinator maintains communication with MA/AIP through written monthly reports and attendance at the meetings of the MA/AIP Board of Directors.

The Office of Gifted and Talented, Massachusetts Department of Education, is also kept informed of the program's activities. This past year the Director, Roselyn Frank, sent out information about the program to all the principals in Massachusetts and has helped in other ways to promote the program to school systems across the state.

Honeywell Information Systems, Inc., the corporate sponsor, actively supports and promotes the MFPSP. Many of the program's evaluators are Honeywell employees and the company contributes the postage and printing of materials, the use of its facilities for evaluation and training sessions, funding for air fare to the National Bowl, and help with the awards. Most recently, Honeywell helped develop a slide tape presentation which is used to train the coaches and to promote the program throughout the state. Joan Duff, Manager of Community Relations, is the Honeywell liaison and coordinates the company's participation in the program.

ISSUES TO CONSIDER

The Massachusetts Future Problem Solving Progam has grown tremendously since its start in 1979, with, in 1985-86, 250 teams registered. Because the program is growing so fast, many people see the need to hire a full-time director and staff. In the years to come, the current volunteer staff, all of whom have additional full-time responsibilities, will not be able to meet the increased demand for services. A paid staff could more adequately provide services to students in all parts of the state, answer questions about the program, attend conferences, go to school systems to help with training, recruit coaches and evaluators, and help support more teams.

FUTURE DIRECTIONS

The MFPSP is in the process of expanding and strengthening its program. One area receiving attention is training for coaches and evaluators. At present, coaches receive an initial training session in the fall to introduce them to the problem-solving process. The program is considering a second follow-up session for coaches after they begin working with the teams.

In addition, the program is looking to decentralize the training, holding several training sessions throughout the state rather than maintaining one training site. To facilitate this, the program would like to develop a videotape to help the evaluation trainers maintain quality control while at the same time reaching more people.

MFPSP is open to all students, in public and private schools. The technique also has been used successfully with special needs students. The MFPSP Board is working to upgrade the marketing of the program by reaching out to school superintendents, presenting information at conferences of social studies and science teachers, and publicizing its willingness to provide workshops at educational meetings

CONCLUSIONS

The MFPSP is a challenging educational program which is helping to prepare the students of today for the future of tomorrow. Learning the problem-solving process and developing a futuristic perspective helps lay the foundation for a generation able to handle creatively the challenges yet to come.

MASSACHUSETTS PREENGINEERING PROGRAM FOR MINORITY STUDENTS, INC. (MASSPEP)

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BACKGROUND INFORMATION

During the late 1970's, several of the nation's large corporations, IBM, General Motors and others, realized that over a twenty year period they would not reach their goals for placing minorities in management positions. To rectify the problem, they decided to stimulate the development of minority engineering programs. Initially, these programs focused on identifying minority students who would apply to and enroll in engineering colleges. However, the number of available students soon dwindled because many minority high school students were not adequately prepared to pursue a degree in science or engineering.

In response to this problem, a pre-college strategy was developed. Across the country, programs were designed in which business and universities worked with the public schools to generate minority students who had the option to go on to higher education and careers in engineering and science. MASSPEP was one of the several regional programs that were established to implement this vision.

PROGRAM FOCUS

The primary goal of MASSPEP is to identify minority students and prepare them for entrance into undergraduate programs in engineering, science and technology. This goal is articulated in the MASSPEP statement of purpose:

> The Mission of MASSPEP is to attract, encourage, motivate and academically assist high potential Black, Hispanic and Native American students in grades 6 through 12 to prepare for admission to a college level program in engineering and science and to successfully complete such programs, in order to increase the number of engineers and scientists available for positions in business, education and industry.

While developing minority engineers is the primary goal of MASSPEP, there are several important sub-goals that contribute to the program's focus. MASSPEP strives to promote leadership in the public school setting in the areas of math and science by working to develop students who are highly skilled in math and science and developing a cadre of teachers with exceptional instructional abilities in these areas.

While it was once run as a program aimed specifically for the academically gifted, MASSPEP is now geared toward helping all motivated students (1) get the most out of their high school education, (2) succeed in math and science, and (3) have more career options available to them. MASSPEP's overall aim is to make a significant contribution to the public schools and to identify some of the problems affecting urban education in the areas of math and science.

ORIGIN OF THE PARTNERSHIP

MASSPEP began as the result of a local initiative to match inner city youth with local technical institutions. A task force composed of university, business, school, and community representatives recommended the formation of an organization that would develop a program to work in conjunction with the public schools.

The MASSPEP program was incorporated in 1980 with the initial aims of (1) improving the quality of public school mathematics and science programs and (2) helping academically gifted students prepare for admission to engineering programs in colleges and universities. Early support from General Electric, Honeywell, Raytheon, the Urban League, and WBZ-TV, leadership from an executive with Westinghouse Broadcasting Corporation, and an organizational grant from the Alfred P. Sloan and General Electric Foundations enabled MASSPEP to establish a formal program at the seventh grade level with Boston Latin School students. The program has grown over the years and currently operates at the following six school sites:

In Boston:

- Boston Latin Academy
- Boston Latin School
- Boston Technical High School
- Jamaica Plain High School
- Mario Umana Harbor School of Science and Technology

In Cambridge:

- Cambridge Rindge and Latin School

STRUCTURE OF THE PARTNERSHIP

MASSPEP operates with a full time staff consisting of an Executive Director responsible for program development and implementation, a Program Coordinator responsible for managing the program at the six school sites, and a secretary. A Board of Directors has fiduciary and policy responsibilities for the program. Members of the Board include the presidents, CEO's, and upper management personnel from Boston Edison, New England Telephone, Honeywell, Digital and other private companies, the superintendents of the Boston and Cambridge School Systems, university presidents, and community agency representatives. The Board has oversight committees including the audit, education, fund raising, and strategic planning committees which work to provide resources to support the activities of the program.

MASSPEP maintains close relationships with the headmasters and teams at the school sites. The School Departments' endorsement of the program enables MASSPEP to have access to the schools' facilities for its program activities. MASSPEP, in turn, seeks the School Departments' approval for its activities and works closely with the Headmasters, meeting with them to develop programs at the school sites that conform to each Headmaster's objectives.

MANAGEMENT AND COORDINATION OF THE PARTNERSHIP

Each school site maintains a four or five person team of teachers and counselors selected by the Headmaster and the MASSPEP office. These teams work with the students at the school site and are the backbone of the program. Team members are paid an honorary stipend of $800 per year, with a team coordinator receiving slightly more. The teams are asked to develop a yearly plan in cooperation with the MASSPEP staff and have a small budget for underwriting MASSPEP activities. The MASSPEP staff meets with the team coordinators on a monthly basis and holds quarterly meetings with the full team. In addition, the program maintains a student advisory council that meets regularly to communicate students' concerns and to discuss program information and activities.

SPECIFIC PROGRAM COMPONENTS

MASSPEP program activities are designed for the maximum benefit of the students, teachers, counselors and parents. They are aimed at (1) helping students develop the skills, competencies, and experiences they need in order to enter technical careers successfully, (2) offering teachers and counselors an opportunity to enhance their instructional abilities and obtain additional educational resources, and (3) helping parents provide guidance and support for their children.

MASSPEP program activities for students include an In-School Program, an After-School Lab Program, and a residential Summer Program. Teachers and counselors participate in regular professional development sessions and in orientation sessions that are conducted frequently to bring together the teachers, students, counselors, and parents who comprise the program's constituents.

In-School Program

The In-School Program, which is based on a club model, is managed by the school's staff team and consists of weekly meetings on Wednesdays and Saturdays. The meetings are designed to coordinate tutorial activities and supplemental services for the students. Speakers are brought into the meetings and students are taken on field trips in order to facilitate their exposure to various science and math related careers. Saturday meetings are used for exposure to technology and to assist students with various projects, such as preparing for the annual science fairs. Counseling plays an important role in the program as does the dissemination of information concerning scholarships, careers, and job applications.

After-School Lab Program

Two days a week MASSPEP runs an After-School Lab Program at the Humphrey Occupational Resource Center (HORC). About 100 MASSPEP students from all of the school sites are bussed to HORC for a laboratory mentor program. The laboratory program uses the vocational education resources of HORC to help students develop a technical skill. Since most of the MASSPEP students are in examination schools, they do not attend the HORC as part of their regular curriculum. However, MASSPEP believes that it is important to prepare students technically as well as academically in the areas of math and science.

Students select an area of study from the HORC curriculum which includes courses in computers, data processing, medical technology, television production, automotives and power mechanics. They have an opportunity to interact with volunteers who work with students on an individual basis and serve as counselors, role models and project advisors. Often the volunteers are undergraduate engineering students and employees of high technology companies.

Museum of Science

Some students participate in a computer enrichment program with the Museum of Science. Students go on Saturdays or after school and work with engineers on a range of projects, such as measuring noise pollution.

Summer Program

MASSPEP also has developed a Summer Program for students in grades 10, 11, and 12. This program is designed to expose high school students to the academic and attitudinal skills and experiences that prepare them for an undergraduate engineering program. The program operates in conjunction with local engineering colleges and students already enrolled in MASSPEP may compete for the 100 slots available.

This intensive residential academic experience consists of a six week instructional and laboratory program followed by a three week internship project. The curriculum is focused on strengthening the student's academic skills and includes a strong emphasis on mathematics, an "Introduction to Engineering" course taught by faculty from participating colleges, physics and science courses with accompanying laboratory programs, and a language arts component.

At the conclusion of the program a profile is prepared for each student and made available to the public schools, the students, and their parents. Upon their request, students may have their profile submitted with their college admission applications to highlight their participation in MASSPEP.

DataBase

In order to improve its monitoring efficiency and to match its program services to students' needs, MASSPEP has developed a database with the help of Honeywell, Inc. This database enables MASSPEP staff to create a composite picture which includes all aspects of the students' growth and performance. Information is collected on the demographics, cognitive styles, aspirations, and personality characteristics of the students. MASSPEP staff use this information to look at the learning opportunities that were available, the opportunities that were pursued by the students, and the context (school or MASSPEP) in which they were pursued. The aim of this effort is to enable higher education institutions to obtain an in-depth and developmental understanding of prospective candidates.

Boston Film Video/Massachusetts College of Art/MASSPEP Collaborative Project

This project is designed to train MASSPEP teachers in computer imaging technologies.

TYPE OF SCHOOL INVOLVED IN MASSPEP

Schools participating in MASSPEP generally have been chosen on the basis of their expressed interest in the program and their ability to provide leadership and support for the development of the project at their school site. For the coming year, however, MASSPEP will be recruiting three junior high schools and has developed critieria for these schools' participation in the program. These criteria will include making a commitment to MASSPEP's goals and agreeing to make math and science priority areas. Schools also will be requested to assess the human and financial resources that they are willing to use in support of the MASSPEP activities and to work with MASSPEP staff on developing a statement of need. The needs assessments will enable program developers to design activities that respond to the goals and direction of the school and of MASSPEP.

TYPE OF STUDENT INVOLVED IN MASSPEP

Recently, MASSPEP developed an open enrollment policy in an effort to recruit more academically diverse students. Because minority students in the public schools often have abilities that may not have been nurtured and developed, the staff went into the school to recruit prospective students. At one school, this personal recruitment resulted in raising enrollment in the program from 10 to 65 students from one year to the next, with most of the students remaining in the program for the entire year.

While most MASSPEP students are members of minorities (Blacks, Mexican-Americans, Native-Americans, and Puerto Ricans) that are underrepresented in the engineering fields, the program does not exclude any students from participation. Also, there is parity in the representation of males and females in this program of 300 students.

POSITIVE OUTCOMES

Over the years there has been a continuous increase in the number of high school graduates who have participated in MASSPEP. Sixteen students have graduated in 1982, 39 in 1983, and 50 in 1984. Many of these students choose to go on to higher education in a technical field.

These numbers are especially significant because, before MASSPEP, there were no minority students from the Boston Public Schools who graduated, for example, from Massachusetts Institute of Technology in a technology field. In addition, Boston University has made full four year scholarships available to MASSPEP students who want to go into engineering. While it is too early to determine the outcome, by focusing on some of the critical areas of the problem like poor math and science performance, MASSPEP has greatly increased the likelihood that minority students will succeed in higher education and in technical careers.

PROBLEMS TO OVERCOME

MASSPEP's mission is to address problems which face both the public school system and its students. School system bureaucracy, the constraints of politics, and the lack of enthusiasm on the part of some professionals in the school systems make it difficult to manage change in these organizations. MASSPEP maintains the position that by identifying the problems it wants to attack, developing a plan, and generating the resources, it will be able to affect change.

The major problem MASSPEP faces is helping students overcome their apathy and lack of self-confidence. Minority students often do not believe they can achieve and be successful in a technical field. MASSPEP strives to raise their confidence level so they can participate in and take advantage of the opportunities available to them.

FUTURE DIRECTIONS

Once MASSPEP is confident that it has develped a manageable and optimally effective model, it hopes to expand its programs to all grade levels of the public school system. Currently, undergraduates and professionals work with the high school students and plans are underway to train high school students so they can work effectively with junior high students. The most challenging aspect of MASSPEP's vision, however, is the goal of engaging junior high students in work with elementary students. Junior high school is a crucial time for most students and MASSPEP believes that it can challenge and redirect this pre-adolescent energy in a way that opens up opportunities for students. In addition, when all levels of the system are involved, MASSPEP believes it will have a reasonably inexpensive vehicle for improving the technical training provided in the public schools.

CONCLUSION

MASSPEP, as an educational agency, is firm in its commitment to address the critical problem of preparing today's public school students for the work of the future. It is working to solidify the gains which the program has made while remaining mindful of the scope and nature of the tasks yet to be undertaken. MASSPEP seeks to have continued cooperation with institutions of higher education and with the private sector in order to upgrade the quality of mathematics and science programs and to provide exposures to technology in the public schools.

NEW BEDFORD SCHOOL-BUSINESS PARTNERSHIPS

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BACKGROUND INFORMATION

Geographic Location

New Bedford is the fourth largest city in the Commonwealth and the largest city in Bristol County. Located in southeastern Massachusetts, the city's natural harbor has had a considerable effect on its history, immigration patterns, and economy. Though somewhat reduced as an economic factor in recent years, the fleet of fishing boats which calls New Bedford home, the fish related industries it nurtures, and several federally funded projects designed to maximize harbor uses are testimony to this natural asset's present importance and potential for the future.

Economic Factors

New Bedford is a city in transition from a once healthy textile-based economy to a heterogeneous industry-based economy. The city's economic plight is characterized by a persistently high rate of unemployment, with one of the lowest weekly take-home pay averages for a city of its size in the country, and a high percentage of residents who receive some form of public assistance.

School System

The New Bedford school department currently operates twenty-two elementary schools, three junior high schools, and one senior high school housing grades 9-12. New Bedford High School has recently been selected as one of the outstanding schools in the country by the United States Department of Education's Secondary Recognition Program.

PROGRAM FOCUS

There are school-business partnerships operating in all of the school levels in New Bedford. The overall goal of most of these programs is to reduce the number of dropouts in the New Bedford Schools. Working with local businesses to provide school-to-work transition programs and with local agencies to provide support services to students and their families, the schools have developed programmatic responses to educational needs through the departments of Career Education, Occupational Education, and Adult and Continuing Education. Most of the programs implemented through these departments also have strong ties to other departments within the schools, such as Special Needs, Guidance, Instructional Media, Computer Services, Transitional Bilingual Education, English, Math, Science, and Elementary Education.

Partnerships with the New Bedford business community mainly benefit secondary school students and are oriented toward increasing their understanding of the world of work, their job readiness, and their entry level skill training. In the elementary schools, partnerships facilitate career awareness and an understanding of economics and the free enterprise system.

PROGRAM COMPONENTS

The partnerships in New Bedford schools vary in their programming, coordination, and funding. A broad range of civic, business, and community organizations work with the schools to conceptualize and implement these programs.

HIGH SCHOOL

The high school participates in several federally funded programs that have been developed to reduce the dropout rate and increase the employability of at-risk and disadvantaged students through instilling appropriate attitudes toward work, upgrading job-related skills, and improving students' self-confidence and self-esteem. These school-to-work transition programs have four major objectives:

- to improve academic performance of students
- to increase school attendance rates
- to expand knowledge of the world of work
- to build an advocacy system to support the students' transition to work

Project Careers offers students skills in one of the following areas: data entry; fast food service; automotive brakes, exhaust, and suspension; and electronic assembling. Through coordination between the administrative staff of the school and the vocational counselor, sophomores, juniors and seniors are released from school, in the second half of the year, to work in part-time jobs related to their skill area. *Project Word Plus* was developed to provide juniors and seniors with concentrated training in the secretarial area to prepare them for the job market. In December, after students have received training in the basics, they are placed in a local company which finds its experience with these students a "two-way street:" the students gain valuable experience and the company gets needed secretarial help when its workload expands. The *Geriatric Health Aide* program trains students in the care, feeding, and safety of the elderly in hospitals, nursing homes or private homes. *Project SLIPP (Student Learning Instant Production Printing)* has been developed to give practical experience to sophomores, juniors, and seniors who have had an introduction to the graphic arts and are interested in the following areas related to printing: typesetting, platemaking, reproduction, and business applications.

In all of these programs, federal grants fund a vocational counselor who works closely with the students to oversee their scheduling and job placement, provide career and personal counseling, and monitor their work experience. Students are placed in the work settings only when they have demonstrated that they have the appropriate skills and display positive work attitudes. The counselors work closely with the students and help them with any problems that arise. They also keep in contact with the businesses to ensure that their expectations are being met and that they are satisfield with these employees. In addition, the counselor continually searches out new companies to participate in the programs. The businesses involved find that the students they get are work-ready and well trained. Many of the companies have retained these students for summer positions and in full-time positions after graduation from high school.

JUNIOR HIGH SCHOOL

The Occupational Education, Guidance, and Instructional Media departments coordinate activities for the junior high school. The *American Career Exploration System (ACES),* a computerized career information program, is available through a career exploration curriculum that is taught by the school librarians and integrated into several different subject areas.

Project Business, a national in-school education program sponsored by Junior Achievement, helps to integrate the resources of the business community into eighth grade classrooms. This program brings economic education and exposure to the world of work into the social studies curriculum. Interested teachers are matched with businesses that agree to participate in lesson planning and classroom instruction for a program that continues one period per week for eight to ten weeks. Adapting a curriculum and activities developed by Project Business, company executives address the "Growth of Business in America" through the following topics:

- The Nature of Economics
- The American Economy and its Problems
- Money and Banking
- The U.S. Market System
- Financial Statements
- Choosing a Career
- Consumerism

A highlight of the program is the field trip, sponsored by Project Business, during which students explore one of the businesses in Southeastern Massachusetts. This business often is the business represented by the "guest teacher" or one which has been used in examples during the lessons. The trip allows students to understand better the numerous career opportunities within companies and to observe the world of work in action.

The Executive Director of Junior Achievement of New Bedford works closely with the Head of the Social Studies Department to recruit teachers and business people for this program. He also coordinates the arrangements for the field trips and solicits new companies for the program.

ELEMENTARY SCHOOL

The elementary school programs are developed by the Assistant Superintendent for Elementary Education and the Director of Occupational and Career Education, who use materials and activities developed for BICEP, an instructional career education program developed originally in the Hyannis schools. This program provides a collection of instructional activities focusing on self-awareness, interpersonal skills, attitudes toward work, decision-making, problem-solving, occupational information, and economic awareness. This curriculum model encourages community involvement and utilizes resource people such as business people, retired citizens, and parents.

ADULT EDUCATION

Through the Adult Education Division of the New Bedford Schools, adults are evaluated for their work and life experience and given credits toward their high school diploma. This Division provides several different programs that help students achieve entry-level competencies in occupational areas and obtain a high school diploma or GED certificate. The business community, the Department of Public Welfare, and state and federal employment and training agencies cooperate with these programs to help address these adults' learning and career aspirations. Counselors in these programs help the clients to develop job seeking and keeping skills and to make contacts with appropriate local employers.

CONCLUSION

The New Bedford School-Business Partnerships have been very successful in responding to the particular needs of this city. With many students and adults in the community who are new to America, the English language, and the American educational system, the schools have been challenged to address a broad range of educational, cultural, and social issues. Through the development of programs that encourage students to remain in school while they are receiving job training and an income, the schools and the business community are helping to build a generation of productive citizens. The schools have been effective in developing coalitions with community businesses and local and state agencies that have enabled them to secure the federal and state funds that support many components of these programs. In addition, the schools have recognized the value of including in all of its programs the counseling and guidance services that have contributed significantly to the success of its students.

NEWSPAPER IN EDUCATION: FALMOUTH PUBLIC SCHOOLS/CAPE COD TIMES

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BACKGROUND

Falmouth is a town of 24,000 on Cape Cod with five elementary schools, one middle school, and one high school. The *Cape Cod Times* has a circulation of approximately 40,000 and covers the 13 towns on the Cape, the islands of Martha's Vineyard and Nantucket, and the off-Cape towns of Wareham, Cedarville, and Plymouth.

OVERVIEW OF NEWSPAPER IN EDUCATION

Newspaper in Education (NIE) was developed by Merrill Hartshorn in 1952 to help educators use newspapers as an effective teaching tool. In recent years, the activities of NIE have been coordinated by the American Newspaper Publishers Association Foundation in Washington, D.C.

Newspapers that adopt NIE generally hire a full or part time NIE coordinator who provides inservice workshops for schools interested in knowing more about the program and training sessions for teachers who will be or are using its materials. In addition, the coordinator is an ongoing resource to teachers and provides support services in response to teacher requests. Teachers use NIE materials to support existing curricula or as enrichment materials in reading, vocabulary, research, and analysis; for journalism and current events classes; as supplemental math texts; and to teach concepts of art. The NIE coordinator is available to provide classroom presentations on the production of the newspaper and the career opportunities connected with the newspaper. Teachers also may take advantage of field trips to the newspaper's office and production facilities.

NIE has developed a wide variety of curriculum materials for classroom use. It publishes a *Bibliography* of over 130 teacher guides and curriculum materials that have been developed by NIE coordinators and educators across the country. In addition, local coordinators develop materials for use on issues and related articles that pertain to their region. NIE also holds training sessions for its coordinators and educators to increase their knowledge of modern teaching and training techniques and to update their information on NIE curricula at all grade levels and for all content areas.

The Massachusetts Council of NIE promotes the use of newspapers by disseminating information to the educational system in this state and consulting with newspapers involved with NIE. It engages in special projects, such as yearly high school newspaper contests among public and private high schools in the Commonwealth. It also provides workshops for high school newspaper editors each year.

MANAGEMENT AND COORDINATION OF THE PARTNERSHIP

Six years ago Falmouth was the site of a pilot NIE project with the *Cape Cod Times*. An NIE representative approached the acting superintendent in Falmouth to explain the program and was recommended to a principal in one of the elementary schools. Two teachers in the school agreed to test the program to see if it was viable as an educational resource. Since that time, through word of mouth recommendations and visits to other principals in the system, the program has expanded to four elementary schools and the high school. Administrators in Falmouth have been very supportive of the program and have actively promoted it among their teachers and the curriculum coordinators in each building. The teachers have requested that the NIE coordinator expand his services and increase the number of inservice training workshops.

Based on the positive reception the program received in Falmouth, the *Cape Cod Times* two years ago hired Mike Garvan to promote and support the program. He has been actively introducing NIE to administrators and teachers in the other 12 towns of the Cape and has received an encouraging response. The commitment of the *Cape Cod Times* has been apparent in the advertisements and tear-off coupons it has placed in issues of the newspaper to reach more teachers and expand their participation.

PROGRAM COMPONENTS

When information is sought about the program, the NIE coordinator meets with the school principal and the teacher or teachers involved to explain the program. Interested teachers are given an introductory workshop on the "do's and do not's" of introducing the newspaper into the classroom and techniques for expanding the usefulness of the newspaper in content or curriculum areas. After one or more teachers have used the NIE materials for a few weeks, the coordinator is available to provide the students with a slide show and discussion on the news, comparing newspapers with other media. This presentation is adapted to the appropriate grade level and can be given to two similar grade levels or classrooms at one time. The coordinator also remains available to the teacher for assistance, curriculum ideas and materials, and other resources.

Mike Garvan suggests that teachers order the paper according to the schedule that fits in with their classroom needs. The cost per student for a subscription to the *Cape Cod Times*, at the half-price student rate, is $.15 per copy. Teachers are requested to provide evaluations of the materials they use and of the total program. These evaluations are used to strengthen the program and, if necessary, to target it more directly to teachers' needs.

The *Cape Cod Times* has run contests for all students in its circulation area. In March, 1986, in conjunction with Newspapers in Education Week, it published a 60 page supplement which contained winning entries by students from 13 school systems in the contest categories of Editorial Writing, Create-an-Ad, and Photography. As part of this contest, students designed logos and advertisements for local businesses that supported the Supplement. *Cape Cod Times* hopes that, in addition to publishing the students' work, this supplement helped to expand awareness of the newspaper as an effective educational tool.

CONCLUSION

Newspapers in Education has been an inexpensive and accessible way to expand the resources of the Falmouth schools and to enrich classroom activities. The *Cape Cod Times*, and other papers that participate in NIE, demonstrate their interest in supporting the educational activity of the schools by making available the materials that NIE has developed. In addition, these community-based resources can be used as catalysts for encouraging additional collaboration among the schools and other community enterprises.

THE OXFORD/DIGITAL CONNECTION

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DESCRIPTION OF THE AREA

Oxford, a small town located in the south central part of Massachusetts, has a modest commercial-industrial base. This community of approximately 11,000 citizens has three elementary schools, one middle school, and one high school in its public school system.

PROGRAM FOCUS

The partnership between the Oxford public school system and Digital Equipment Corporation (DEC) is focused on enhancing the education that students receive by providing training and work experiences not normally available to public school students. Digital provides computer hardware, computer training, work experiences, and the expertise of its executives in the interest of helping students and staff become computer literate. Digital benefits by assisting to develop a computer-proficient population, some of whom become employees, DEC equipment users, technicians, and designers.

ORIGIN OF THE PARTNERSHIP

In the Fall of 1980, the administration, staff, and school committee of Oxford were faced with the pressure of knowing that their school system was years behind the times in computer education. There was *one* computer terminal for every 1,000 students. Further, the newly passed tax, "Proposition 2½," threatened all non-essential programs and program expansion in Massachusetts' schools. The French River Teacher Center, a professional development center operated under the Oxford Public Schools for teachers from 30 central and eastern Massachusetts school systems, arranged an exploratory meeting between Digital Equipment Corporation's Manager of Educational Relations and a team of administrators from the Oxford school system. Digital had no plants in Oxford and few employees residing in the town. It was approached because it is the world's second largest computer company, employing approximately 80,000 people. Headquartered in Maynard, Massachusetts, DEC has more than 24 facilities in the state and is known for its partnerships at all levels of public and private education.

The administrators were forthright about their system being not only computer illiterate but a non-Digital user. DEC was willing to consider a partnership, however, because of the sincere commitment to innovative education that the Oxford School staff demonstrated and the willingness of the Oxford administrators to listen to the needs and views of industry. Future meetings and discussions led to the implementation of

training programs in electronic techniques for Oxford teachers. Field trips and computer equipment also were made available to students. Over a period of months, the Oxford Public Schools were able to purchase their own Digital hardware with the help of discounts from Digital and with state and federal Occupational Education grants.

STRUCTURE OF PARTNERSHIPS

The Oxford/Digital Connection works because of the efforts of four institutions, Digital Equipment Corporation (DEC), the Oxford Public Schools, and two organizations that operate under the Oxford Public Schools, the French River Teacher Center (FRTC) and Project COFFEE.

A Digital executive who is on loan part-time to the Oxford public schools, the Superintendent of Schools, and the Directors of the two educational agencies comprise an informal group that determines the direction of the Connection. This group takes overall responsibility for providing resources, identifying needs, planning programs and disseminating information. Task forces composed of Oxford teachers, FRTC teachers, Project COFFEE staff, and DEC employees are very involved, however, in the conceptualization and planning of all programs.

French River Teacher Center

The French River Teacher Center (FRTC) provides support and resources to the 25 neighboring towns that participate in its programs. Because of the affiliation with FRTC and Digital, teachers and students in the 25 towns have been provided with computer training and the schools have been able to purchase computer hardware and software using Digital discounts and state and federal funds. Presently it is estimated that approximately 4000 students and 100 teachers have been trained through this Connection and, when the training is complete, that over 10,000 students and 500 teachers will have been served.

Project COFFEE

Project COFFEE is a six year old alternative program for alienated and disaffected youth from Oxford and 12 surrounding towns. This Project, which has been designated a National Lighthouse Model for using technology in education effectively and is a model program in the National Dissemination Network, provides academic and vocational training for over 100 students each year at three locations in five programmatic areas: computer repair and maintenance, buildings and grounds, word processing, horticulture/agriculture, and distributive education. The Director of Project COFFEE works closely with Digital employees on the design and implementation of its programs.

MANAGEMENT AND COORDINATION OF THE PARTNERSHIP

The partners work with each other in varying configurations, as required by different projects, and coordinate the use of resources and the implementation of new programs. In addition, DEC works directly with the Oxford Public Schools to develop programs which expose students and staff to computer hardware and provide work experiences in computer and technological areas. The Superintendent of Schools oversees the schools' participation while the Manager of Educational Relations oversees Digital's involvement.

The Directors of the French River Teacher Center and Project COFFEE, both of whom are responsible to the Oxford Superintendent of Schools, coordinate their activities with each other and with the Superintendent. They also plan and implement programs for their regional constituencies and work with these systems to expand their involvement in the Digital Connection.

Digital has the advantage that while it works primarily with the Oxford Public Schools system it reaches many communities through the regionalized projects. Some of the regional communities, however, have established their own ties with Digital and developed programs to address their specific needs.

SPECIFIC PROGRAM COMPONENTS

French River Teacher Center

The French River Teacher Center coordinates two major programs that are made possible through the Connection.

- The Computer Bus Training Project is a mobile unit which brings computer equipment to schools for a month at a time in order to train teachers and students. The Massachusetts Department of Education, Division of Occupational Education, has provided funding to assist with this program. Over 10,000 students and 500 teachers will benefit from the training that this program makes possible.

- Project 50/50 is a three-year commitment by Digital to assist in the provision of computer skills, in a summer camp setting, to ninth grade students from 10 towns. Fifty percent of these ninth grade students are female, minority, disadvantaged, or underachievers, while the other fifty percent come from the general population. "Campers" are given the computer skills and experience that will help to maintain their interest in school and increase their likelihood of getting jobs after high school. Follow-up sessions in school and through other Project 50/50 programs help to maintain their skills. Some funding for this program comes from the Department of Education's Division of Curriculum and Instruction. Adaptations of Project 50/50 and its adoption by the State Skills Center resulted in 750 students and 50 teachers receiving computer training during the summer of 1983.

Project COFFEE

Project COFFEE works with Digital and other business partners to provide over 100 alienated students from 18 towns in grades 8-12 with the skills they need to obtain entry level positions after high school. These students have been identified as not likely to develop employable skills and positive work attitudes. Through Project COFFEE they participate in internships during the vocational sequence of their morning program and to earn money and develop work experience in the afternoon. The following programs demonstrate the emphasis of Project COFFEE's offerings.

- The Computer Maintenance and Repair Program is designed to give students hands-on training and experience with state-of-the-art equipment. Several of the students have been trained at Digital to repair Digital equipment and have been encouraged and supported by DEC in an entrepreneurial enterprise in which they obtain and service contracts on DEC computers at some of the FRTC schools and at business sites.
- The Word Processing Program trains students in modern office practices and also provides an office environment in which to work. Project COFFEE also has developed an entrepreneurial project in the word processing program. Students manage and run a business which services requests such as printing town reports, typing college papers, developing mailing lists, and other word processing functions.

Oxford Public Schools

The schools and Digital have engaged in the following additional programs:

- Project CHIMES is a research project on chronobiology (body time) that is being undertaken in collaboration with the Talcott Mountain Science Center in Avon, Connecticut and the University of Minnesota. This 20-year project is correlating research on how and when children learn.
- Project OLIVE brought together, in 1983, 32 business education teachers from 14 high schools to learn about careers in high technology.

CONCLUSIONS AND IMPLICATIONS

The Connection demonstrates a collaborative commitment to bringing the computer literacy of students and teachers in Oxford and its surrounding towns up to the level of state-of-the-art technology. In undertaking this project, all of the parties to the partnership have benefitted, resulting in decreasing the cost of providing high technology training for the schools and increasing the number of computer literate future employees from this region for industry.

Through regionalization, this Connection has multiplied its impact, allowing the number of students, teachers, and citizens who were, and will continue to be, trained to grow into the thousands. In addition, the Connection has strengthened the lines of communication between schools and industry, ensuring that future partnership opportunities can flourish in these communities.

The Connection built its regional programs on existing agencies that had a history of providing educational services and resources to the neighboring communities. By using these organizations, the Connection was able to build on an established administrative base. This base reduced the numbers of people with whom trust relationships had to be built and facilitated the Connection's ability to be responsive to opportunities and changes in the technology market.

PEABODY EDUCATIONAL COUNCIL

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BACKGROUND

Peabody is a city in the northeastern part of Massachusetts with a population of 46,000. It has eight elementary schools, one middle school and two high schools. This city is successfully transfering from economic dependence on the leather industry to the development of an economy that is based on high technology and service industries.

PARTNERSHIP FOCUS

The Peabody Educational Council has organized with the goal of improving Peabody's educational system. It addresses the needs of the schools through three vehicles:a community speaker's program that brings business and community expertise into the schools; a "Best Bet" mini-grants program for teachers; and a job opportunity program that helps to prepare students to enter the workforce. Committees composed of business people, community representatives, and teachers and school administrators develop and coordinate the activities in these programs and have expanded and enhanced the resources of the schools and the community's involvement in the schools.

PARTNERSHIP HISTORY AND COORDINATION

In 1983-1984, Peabody Superintendent of Schools, James Buckley, Jr., approached the business community, through individual companies and the Chamber of Commerce, to discuss ways in which they could help the schools. The Chamber referred Buckley to Karen Kezerian, Senior Vice President of the Warren Five Cent Savings Bank and the President of the Chamber, who brainstormed with him about possible directions. As a result of these discussions, in 1984-1985 the Warren Bank installed in Peabody's Burke Elementary School a branch office which was operated by the students and of which students were the bank officers. The local newspaper printed several articles on the activities of the school branch and on other services the Warren was providing, such as teaching special education students to balance their checkbooks. The success of this project helped to create a climate in the schools and in the community that was conducive to the development of further school-business collaboration.

In June, 1985, several members of the Peabody Federation of Teachers attended a conference on school-business partnership in Washington and, on their return asked for a meeting with a Superintendent and Mayor Peter Torigian, who also serves as Chairman of the School Committee. Representatives of the Federation suggested that a group of concerned education, business and governmental leaders be formed to research possible forms of school-business collaboration for the city. The Mayor responded immediately by appointing a representative task force that researched existing programs in Massachusetts and other states and developed a proposal for a three-component program for Peabody. This proposal was presented to and enthusiastically endorsed by business and governmental leaders in September, with many of these leaders agreeing to serve on the newly established Peabody Education Council. This Council met for the first time in late September, 1985, and has continued to meet monthly.

The Council is chaired by Karen Kezerian and operates three programs, each of which has a committee that implements it. The subcommittees have among their members business people, community representatives, and teachers and administrators from the Peabody schools. Subcommittees meet as often as is necessary to plan and carry out their programs and the Council as a whole uses its monthly meetings to

report on subcommittee progress. Council meetings, which are held from 7:30-8:15 a.m. on the third Thursday of the month, have enjoyed excellence attendance and have strictly adhered to their forty-five minute timeframe.

The Mayor was very instrumental and successful in soliciting the original twenty-five members of the Council. He clearly indicated that involvement on the Council would require time at committee meetings, a corporate commitment of time in the schools, and a no-minimum financial contribution. The first year's Council raised over $15,000, with $6,000 coming from the City of Peabody; $5,000 provided by business/community contributions; $3,400 donated by the School Department; and $1,400 provided in funds for specific projects. In 1986-1987, the Council expects to increase its contributions from members and to expand its base by inviting "associate members" to participate through contributions and involvement in the schools. The "associate members" will form a pool of businesses from which future Council members will be selected as companies relocate or serve their term with the Council. The present "waiting list" of companies desiring to join the Council will form the nucleus of the associate members.

PROGRAM COMPONENTS

Community Speakers Program

This program brings business and community representatives to the school who have expertise in topics of interest to students and teachers. It also provides students with the opportunity to participate in on-site lecture and tour programs at various businesses. The Coordinator of Curriculum encourages teachers to request speakers for their classrooms and works with the Subcommittee to match the speaker's bureau listings with the requests. The Committee uses its personal connections to fill the requests, often going beyond the resources of the Council, and has arranged for speakers on such diverse topics as bank accounts, the history of Peabody, suicide, and the process of putting out a newspaper.

Best Bet

This program is modeled on the program of the same name that operates in Burlington and was started by John Rennie, President of Pacer Systems, Inc. The Best Bet committee provides funding for teacher-initiated educational projects that the School Department has not funded in its regular budget. Each year, the Peabody Federation of Teachers disseminates request-for-proposal forms that invite teachers to submit project ideas for funding. The Committee reviews the proposals and determines which ones it will fund. Committee members hope to enhance student interest in education by creating opportunities for exploring special projects and to encourage teachers in curriculum innovation through utilizing creative academic ideas and educational resources. In the first year, 47 projects were funded, including visits by poets, humanities packages for special needs students, and computer software packages. In addition, some companies provided "project matching" monies or equipment for specific programs, such as a cash register for the distributive education classes and video tapes on photography.

Job Opportunity Program

This Committee works to prepare students to enter the workforce through providing seminars, company tours, counseling, and placement opportunities. The program is targeted toward high school students who will not be going on to higher education. In 1985-1986, the committee implemented two aspects of its program: in-class employment preparation seminars for seniors, which focused on interviews, and a Job Fair. Teachers and committee members met and planned a curriculum on resume writing and interviewing for jobs. Committee members taught the class and gave each student a practice interview.

Prior to the Job Fair, students completed a questionnaire that indicated their employment and career objectives. Committee members also surveyed local businesses to determine their employment potential and their interest in participating in the Fair. Over 1000 students, junior and seniors, had the opportunity to meet with representatives of over 30 businesses and to ask questions on job availability and advancement.

CONCLUSION

The success of the Peabody Education Council demonstrates the impact that partnerships can have on schools and communities in a relatively short time period when the partnership organizers are committed to the idea and understand how to mobilize resources in the community. Mayor Torigian recognized that "the time was ripe," following the success of the pilot project with the bank. When the Peabody Federation of Teachers approached him and Superintendent Buckley, he took the opportunity to capitalize on positive feelings and momentum by proceeding immediately to form a task force which was to work intensively over

the summer. He selected individuals for the task force who had indicated an appreciation of school-business collaboration and who would be energetic and inspirational leaders. Also, he was ready to contribute school and city funds to emphasize his dedication to the value of school-community collaboration.

Another ingredient that has contributed to the success of this collaboration has been the involvement of individuals at varying levels in the organizations involved. School administrators and classroom teachers participate with company executives and managers in the planning and implementing that occurs in the three committees. These committees have the responsbility for all of the work of their programs and, because of the presence of the appropriate school staff, are able to make decisions that are practical, realistic, and relevant to the school's needs. The businesses involved benefit from understanding, rather than guessing at, how schools function. In addition, they are participating in significant programs that make an important difference in students' and teachers' school experience and that indicate their active interest in the health of the community.

The open communication within each committee and among the Council members has been very effective in helping the Council to evaluate and adapt its programs. Successful aspects of programs have been strengthened and weaker components have been redesigned to make them more responsive to teachers' and students' needs. The Peabody Education Council takes pride in its accomplishments and has put in place a mechanism that should ensure it continued success in its "quest for Excellence in Education."

SOUTH BOSTON HIGH SCHOOL/FEDERAL RESERVE BANK/ GILLETTE COMPANY PARTNERSHIP

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DESCRIPTION OF THE AREA

South Boston is a blue-collar section of Boston that has experienced a decline in its economic development. The population of the area has been stable for many years and has numerous long-time residents. South Boston is noted for its ethnic diversity, with residents of Irish, Italian, Polish, Lithuanian and Eastern European descent. South Boston High School services a student population from the communities of South Boston, North Dorchester, Roxbury, and Allston/Brighton.

PROGRAM FOCUS

South Boston High School has worked closely with the Federal Reserve Bank of Boston and the Gillette Company to link students to the human and material resources of these institutions. By pairing with Federal Reserve and Gillette, South Boston High is able to provide pre-job and job related skills for its students. The school-business partnership also links students with people in the business community who can help them develop business and interpersonal skills. Implicit in these school-business partnership efforts is the program's major goal of developing the abilities of the students in order to raise their self-confidence and their marketability in the workplace.

ORIGIN OF THE PARTNERSHIP

During the middle 1970's, the Boston Public School System experienced a great deal of racial tension. South Boston High School, in particular, received negative attention for its problems. After many months of disruptive behavior and a federal court order which brought in a new administration, South Boston High began to restructure itself and its curriculum and the educational climate improved. In addition, in the late 1970's, South Boston High began to develop collaboratives which linked cultural, social, and business groups and agencies with the school. By re-defining its community to include churches, social service agencies, medical and cultural institutions, universities, business, and industry, South Boston High was able to enhance its educational position.

The South Boston/Federal Reserve Bank of Boston/Gillette Company collaborative was developed out of the need to help students develop skills and abilities which would increase their interest and performance in school. The participants believed that it was not enough to teach and learn within the confines of the school; it was also important to connect students with the "real world" through involving them with the business community. Therefore, programs which emphasized the use of human resources were developed, with a focus on helping students develop interpersonal skills and business-related knowledge.

STRUCTURE OF THE PARTNERSHIP

The partnership, which originally was under the umbrella of the Tri-Lateral Council for Quality Education, now functions under the successor organization, the Boston Compact. Decision-making and planning for the activities and programs of the parternership are undertaken by a Coordinator from each of the participating organizations: Anita Jamieson, South Boston High School; Lillian Seay, Federal Reserve Bank of Boston; Daniel Leavitt, Gillette Company. These coordinators work closely with teachers and students in the school in the development of their programs. Funding and resources required to maintain the programs are contributed by the school and the businesses.

MANAGEMENT AND COORDINATION OF THE PARTNERSHIP

The Coordinators of this partnership develop programs for students through meetings, by telephone, and through written communication. At the school and business sites, activities are structured to meet the needs of the students without disrupting the functioning of either the school or the businesses. The Coordinators meet regularly to evaluate their efforts and to plan both long and short term programs. Equipment and materials used by the students are managed by the Coordinators. The production and dissemination of program materials is handled primarily by the school. Federal Reserve Bank and Gillette Company personnel who are involved in the project serve as consultants and, as required, provide technical assistance and direct instruction.

SPECIFIC PROGRAM COMPONENTS

The South Boston High School, Federal Reserve Bank of Boston, and the Gillette Company have collaborated to develop the following program components:

A New Beginning
This five-session workshop is designed to provide direction and support to ninth grade students. The sessions cover transitions from middle to high school, course requirements, special programs, success in school, and college and business opportunities.

Get a Job Workshop
This five session program includes the application process, getting the first job, grooming tips and body language, interviewing tips, and an interview by personnel from the Federal Reserve Bank and the Gillette Company.

Quest
Designed for high achieving 9th graders, this field-experience program includes trips to museums, libraries, community agencies, hospitals, the theater, and the ballet. Funding is contributed by the Gillette Company.

Training
The school and the businesses conduct sessions in interpersonal and business skills for students at all grade levels on an ongoing basis.

CONCLUSION

South Boston High School has been able to link effectively with the Federal Reserve Bank and the Gillette Company in a partnership that has lasted for several years. The school has benefitted from this relationship by strengthening its curriculum and providing skill development training for world-of-work field experiences to students. The businesses benefit by having the opportunity to screen prospective employees, increase their understanding of the schools, and enhance their image in the community. Over the years, these businesses have placed many students in both full-time and summer positions, hiring trained, motivated employees and providing the South Boston community with productive, employed citizens.

SPRINGFIELD PUBLIC SCHOOLS/MONSANTO COMPANY PARTNERSHIP

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BACKGROUND

Springfield is a city of over 160,000 people in southwestern Massachusetts with 30 elementary schools, 6 middle schools, and 3 high schools. Springfield School Volunteers, Inc., located in the Springfield Public School Department, provides a range of services and programs to the schools through its corps of trained and supervised volunteers. Monsanto Company, whose headquarters is in St. Louis, has 1400 employees in its Springfield facility.

Program Focus

This partnership has been developed to help meet the challenges that are confronting teachers in the fields of math and science. Teachers in junior and senior high schools have the opportunity to participate in in-service seminars that update their scientific knowledge and provide them with information and demonstrations they can use in their classrooms. These seminars emphasize the relationships between science, mathematics, and the application of technology in industry so that teachers can assist students in translating the relevance of their academic work to the "real world."

ORIGIN OF THE PARTNERSHIP

In the 1979, Springfield School Volunteers (SSV) expanded its program by helping to develop partnerships between businesses and schools. It began an active solicitation program in which it reached out to businesses to determine ways in which individual companies would like to become involved with the schools. In the early 1980's, in response to the governor's Partners for Excellence program, representatives from Monsanto met with the Springfield Superintendent of Schools, school committee members, and leaders of the teachers' union to discuss how they could collaborate in partnership. The Monsanto Company felt that it could make its most valuable contribution by providing training for teachers in science and math. Working closely with SSV and Springfield Public School staff, Aaron Zolatar and Manuel Drumm, Research and Development managers at Monsanto, developed a curriculum that addressed the needs of teachers for state-of-the-art technological knowledge, an understanding of its applications to classroom science and math, and an appreciation of the industrial applications of basic and advanced science and math. They also established with SSV procedures for implementing the program and for addressing the educational goals that the Springfield schools had for their teachers.

STRUCTURE AND MANAGEMENT OF THE PARTNERSHIP

This partnership is coordinated through Maria DeAngelis, Coordinator of the Corporate Action Program of Springfield School Volunteers, and Thomas McAuley, who has assumed responsibility for this program following the retirement from Monsanto of Manuel Drumm. As with all SSV business programs, this partnership is managed as a part of the Springfield School Volunteer Corporate Action Program.

Springfield School Volunteers, Inc. Established in 1968, SSV serves as a liaison between the community and the Springfield Public Schools. It has a Board of Directors, Springfield School Volunteers, Inc.,

which is eligible to receive tax deductible contributions. The Board is composed of school administrators, business and community leaders, and parents and receives funding from the Springfield Public Schools and from its fundraising efforts among business and industry. SSV has a staff of six and manages six programs that bring a range of volunteers, including parents, senior citizens, students, business people, and other individuals in the community into the schools for short-term or year-long volunteer assignments. Volunteers serve as classroom aides, librarians, mentors, tutors, living historians, and lecturers on special topics. In 1979, SSV developed its Corporate Action Program which coordinates major programs with area businesses and higher education that enhance the curriculum in all K-12 schools.

Each year, Monsanto staff meet with SSV staff and Springfield Public School supervisors of math and science to review the previous year's experience and to adapt the design of the program as appropriate. SSV staff take responsibility for publicizing the program within the schools and for recruiting potential teachers for the seminars. They also notify principals of the need for substitutes to cover the classrooms of the teachers in the program. The curriculum supervisors review the teachers' written projects for each session and certify that teachers have successfully completed the program and earned in-service credits.

Monsanto develops the curriculum for its seminars, recruits scientists to lead the sessions, secures space at Monsanto, and oversees the implementation of the program. Monsanto staff continually evaluate the sessions to ensure that they are meeting teachers' educational needs and are providing teachers with information that will be useful in their classrooms.

PROGRAM COMPONENTS

In recent years, this six week program has begun in February and met for a full-day every other week. Five science and five math teachers are selected from individuals who apply for the program, with occcasional places given to non-math teachers who have adequate background in math or the sciences. The seminars meet at the Monsanto plant and are led by senior level Monsanto scientists. The seminars have covered the following topics:

- Electromagnetism. A review of electrical and magnetic theory lays the groundwork for a discussion of industrial applications of electromagnetics.
- Quality Assurance and Process Control. A survey of statistical quality control concepts and review of how this technology is employed in chemical manufacturing.
- Thermodynamics. First principles of thermodynamics and heat transfer are related to daily life. Industrial applications are reviewed with emphasis on energy conversion, storage, and measurement techniques.
- Applications of Computer Technology. This session provides an overview of the ways in which industry employs computers in research and development, manufacturing, and office automation and of the ways in which it changes to take advantage of state-of-the-art technology in data processing.
- Polymer Synthesis and Property Determination. Teachers are given a brief overview of how polymers are made, modified, and characterized with special emphasis on the effect that molecular structure has on physical properties of polymeric material.
- Hazardous Waste: Emerging Technologies. This session, specifically requested by the school system, reviews past, present, and future technologies that relate to industrial generation of hazardous waste.
- Biotechnology. New techniques are reviewed and discussed for producing both microbes and plants with unique genetic traits that affect agricultural productivity.

Each seminar includes 1) a review of basic concepts, 2) a description of applications, 3) demonstrations, and 4) the preparation of written summaries or curricula by each teacher. The teachers are paired into math and science teams in order to allow more in-depth discussions and a broader base for interpretating and applying the seminar materials. Monsanto scientists assist the teachers in the preparation of their projects and in some cases have served as ongoing resources to teachers after the seminars have concluded.

Teachers are asked to submit to the SSV office the curriculum materials that they develop in order to have them evaluated for in-service credit. This credit is used toward salary "step" increments for teachers.

FUTURE DIRECTIONS

Monsanto is interested in expanding the program to include teachers in some of the communities surrounding Springfield in which its employees reside. It plans this year, in collaboration with SSV, to offer one position per community to two neighboring towns on a pilot basis. Monsanto scientists are also revising the seminar curriculum slightly to enable them to develop a topic which will carry through all six sessions. They feel that a topic, such as automotives, will help to connect the sessions and will simulate teachers' experience with integrated "units of study."

CONCLUSION

This partnership addresses the professional development of teachers by providing them a forum in which they can renew and update their knowledge of and skills in math and science. Monsanto employees share their expertise and resources with teachers who want and are in need of this information and of practical applications and demonstrations for their students. The Monsanto company has found that this partnership gives it a vehicle for becoming involved with the local schools in a meaningful way. The company has demonstrated its commitment to the partnership by reassigning responsibility for it when its original developer retired and by the conscientious effort it puts into updating and refining the curriculum. This partnership has enabled the Springfield Public Schools to reach over 60 teachers, since 1983, with practical, curriculum related professional development that has upgraded the teaching in science and math for over 7500 students.

WORCESTER SCHOOL-BUSINESS PAIRING PROJECT

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DESCRIPTION OF THE AREA

The Worcester School/Business Pairing Project is comprised of the Worcester School System, Worcester area businesses, and the Center for School-Business Initiatives, an affiliate of the Worcester Area Chamber of Commerce. Worcester is a city of 165,000 people in central Massachusetts that has historically been a center for heavy industry and manufacturing. Recently the city has been involved in major redevelopment efforts aimed at maintaining and renewing the economic health of the area. The Worcester school system is composed of 40 elementary schools, four middle schools, and four high schools.

PROGRAM FOCUS

The goal of the School/Business Pairing Project is to provide a systematic and comprehensive career awareness and exploration program for students in grades 8 through 12 in the Worcester Public Schools. The partnership seeks to establish career education as an integral and permanent component of the educational system. A unique feature of this educational experience is that it is planned, coordinated, and implemented by staff from the schools, community agencies, and area businesses.

ORIGIN OF THE PARTNERSHIP

Career education efforts have waxed and waned in Worcester over the last ten years. A significant foundation for these efforts was laid by the Worcester Area Career Consortium which created strong interest in career education. Through involvement in the Consortium, many local businesses become aware of the need for career education in the schools and contacts between school and business representatives developed. Although the Consortium dissolved, interest in assisting the school department with career exploration activities remained strong in Worcester's Norton Company and discussions between Norton Company and school staff associated with career education continued. School personnel indicated their belief that eighth graders provided a target population for which career awareness activities would have maximum impact. The Norton Company responded in 1981 by collaborating with school personnel to prepare and implement in each middle school a career awareness program that helped students begin thinking about career-related decision making.

Morgan Construction Company also had been involved in Consortium activities and had developed a keen interest in career education. The President of Morgan and the Superintendent of Schools met and talked informally at a social gathering in 1982. Morgan's President learned of the severe impact Proposition 2 had on the schools' ability to provide guidance and career counseling support for students. He offered to help respond to the school system's needs and assigned two staff from the company to the project.

During the Summer of 1982, the two Morgan employees, joined by people representing a range of companies, came together for a series of planning meetings with school staff. School people identified areas,

ranging from career days to job shadowing, that had potential for collaborative activities with businesses. These areas were prioritized and the business representatives identified the priorities to which they could immediately respond. In October, 1982, the Morgan Construction Company initiated a pilot pairing project with Burncoat Senior High School. Morgan coordinated a career education program for seniors, which included career counseling and career days, and recruited a range of employee representatives from area businesses to participate in these programs.

The program was judged successful in the first semester of 1982-1983 and was expanded to include all four Worcester high schools in the second semester. Other area businesses each agreed to be paired with the other three high schools as host companies and the pairing partnership program was launched.

In the summer of 1983, the school system held a three-week workshop for its guidance counselors, several English teachers, and business representatives from the host companies. The goal of the workshop was to evaluate the year's career education activities and to systematize and integrate the existing programs into a comprehensive career education effort. Every guidance counselor in the system agreed to take active responsibility for career education programs during the school year and curricula were planned for each grade level. In 1983-1984 an integrated career awareness, orientation, and preparation program was implemented for grades 8 through 12, with the active involvement of area businesses.

STRUCTURE AND MANAGEMENT OF THE PARTNERSHIP

In the early years of the partnership each grade level had a distinct career awareness program and one company which oversaw that program. The Norton Company was responsible for the eighth grade program, the Chamber of Commerce for the 9th grade program, and Morgan Construction Company for the 10th through 12th grade programs. These institutions took responsibility for coordinating the grade level program throughout the school system by providing orientation to business people, networking contacts for the entire effort, assisting with problems, and implementing follow-up and evaluation activities.

In later refinements of the project, the implementation of programs at both school levels was facilitated by pairing each of the schools with a host company. The host companies helped to schedule resources for the schools and to solicit the business community to participate. As the project has evolved, these tasks have been taken on by the Center for School-Business Initiatives and the Mohegan Council/Worcester of the Boy Scouts of America.

Center for School-Business Initiatives. The Center, an affiliate of the Worcester Area Chamber of Commerce, was formed in 1985 through a merger of the Center for Business Initiatives (CBI) and the Worcester Area Chamber of Commerce's School-Business Partnership Committee. CBI and the School-Business Partnership Committee had extensive experience in providing services to schools and in linking the school and business communities. The Center operates several programs including the School-Business Pairing Program, the Audio-Visual Center, Mini-Grants for Worcester Teachers, the Principals' Center, Math/Science Teacher Training, and others.

The Pairing Project is overseen by the Center's School-Business Pairing Committee, which is chaired by a business member and has representatives from each of the 8 host companies, the 8 schools involved, central office school administrators, and the Center. This Committee meets periodically to review the Project's programs and to set policy.

The Center provides administrative support and program development services to the Worcester School-Business Pairing Program. It helps to maintain and expand the school-business liaisons and develops new relationships and opportunities for the schools. The teacher training programs developed by the Center, as well as the professional development activities of the Principals' Center, also serve to enhance and expand the vehicles for interaction between Worcester educators and business people.

Mohegan Council/Boy Scouts of America. Through the Career Awareness Exploring Program of the Boy Scouts of America, local councils are able to work with the schools to provide high school students with an insight into a variety of careers to help them make better-informed decisions about the future. Councils have the opportunity to develop, with their local school officials, a program of career seminars and tours, conducted during school time, that address the career awareness needs of area students. The male and female students serviced by the program become "Career Awareness Explorers" through the payment of an annual fee of $2.00 per student. This fee generally is paid by the school contracting

with the local council in return for the coordination and oversight of the career awareness programs. The national office of BSA provides sample forms, guidelines, and public relations materials, although local councils have considerable latitude in the implementation of the program.

In 1984, staff from the Mohegan Council/Worcester contacted the Worcester Public Schools and the Chamber of Commerce to indicate interest in piloting a career awareness program similar to a program that the BSA was running in Rhode Island. The schools were interested in this idea and in the fall of 1984 speakers were scheduled into one school in cooperation with the school guidance counselors. The success of the program resulted in its expansion, in the second semester, into all four of Worcester's High Schools. The schools have had very positive feedback from the program and have found that BSA staff have freed business executives and the Center for School-Business Initiatives from the time-consuming tasks involved in speakers programs and allowed them to develop additional programs for the schools.

The Directors of Occupational Education and of Guidance are the two primary coordinators for the school system. Guidance counselors in each high school coordinate the programs in their respective schools. Additionally, some teachers are actively involved in and take responsibility for specific programs. School staff involved in the pairing project provide the following services:

1. Recruitment of students for the programs
2. Preparation of students for participation in all programs
3. Coordination of school schedules for programs
4. Evaluation of programs and follow up with students
5. Implementation of and teaching in some of the programs
6. Initiation of and participation in the planning and design of career oriented programs

The major costs associated with the project are incurred in employee hours. The participating schools and the businesses have written project tasks into the job description of the staff involved. Other non-personnel expenses are also absorbed. The companies that use films and visual aids in their programs have prepared these materials at their own expense. The school department covers student related expenses such as the fee to the Mohegan Council, materials, and travel.

SPECIFIC PROGRAM COMPONENTS

The Worcester School/Business Pairing Project presents a sequential approach to career awareness which allows students gradual exposure to career planning concepts and a range of employment areas.

A. **Grade 8 - "Planning for your Future"**

Norton Company and the school system developed this program to assist 8th graders in beginning to plan for their future. All 8th graders in the system participate in decision-making seminars that are conducted by business people in the school setting. These sessions provide students with an initial opportunity to assess their interests and aptitudes and to begin to think about the relevance of their academic choices to their career interests.

B. **Grade 9 - "This is Worcester"**

This program, which is for all 9th graders, was developed in conjunction with the Chamber of Commerce. Its major goal is to provide students with information about the city of Worcester and its potential in relation to the students' careers and future. Films and presentations by community members form the core of the program.

C. **Grade 10 - "Career Awareness"**

This program provides 10th graders with a systematic opportunity for inquiry into the world of work. It is a voluntary program, open to all 10th graders, and is presently coordinated by the Mohegan Council of the Boy Scouts of America. The program runs in two cycles, in the fall and the spring. In each high school, students are administered an interest inventory. Based on the results of the survey, the 10-20 most popular areas are identified and a Speakers Bureau, composed of local business people, is developed. BSA staff recruit, train, and provide orientation to these speakers who are selected on the basis of their career area, their ability to speak effectively to high school students, and their orientation toward encouraging students to complete their education. Speakers have ranged from the "glamour"

careers, such as radio and television, to legal and medical professionals and have included men, women, and minorities.

The programs are tailored to the special needs and interests of each of the four high schools. BSA staff have turned to the Center for School-Business Initiatives and its executive board for some of the speakers and are present at each school during all of the speaking engagements. Students are informed that the program is coordinated by the Boy Scouts and BSA staff wear their dress uniforms when they are in the schools for the programs.

D. **Grade 11 - "Career Orientation and Exploration"**

This is a voluntary program with the goal of involving selected students in a variety of community activities such as site explorations, job shadowing, and internships. Each school and its host company sponsor an essay contest, through the honors English classes, in which students may write on the career of their choice. The winners of the contest in each school, a total of approximately 60 students, are given the opportunity to "job shadow" in the field of their choice. Students also are invited to an awards luncheon, hosted by local colleges, at which local company executives speak on preparing for careers. In 1986 this program was expanded to include an opportunity for selected students from the career awareness classes to participate in this program.

E. **Grade 12 - "Preparation"**

This program is offered on a voluntary basis to seniors and is implemented through career English classes by the teaching staff, although business representatives participate in some of the sessions. This curriculum unit was designed to emphasize basic employability and job retention skills and incluides sessions such as:

1. You and Your Career
2. Skills in Obtaining Jobs
3. Job Interviews
4. Survival Skills on the Job
5. Planning for Success in the World of Work

CONCLUSIONS AND IMPLICATIONS

The initiation of and commitment to this project by company executives and school administrators have been essential factors in the success of the School/Business Pairing Project. This commitment is especially evident in the school system's and the companies' willingness to free staff to participate. Additionally, executive support has opened the doors for networking among business people that provides many resources for the schools.

A review of the process used to identify and meet the students' needs reveals some valuable insights into the program's success.

1. School people identified the needs of the system. Business people then replied with their list of practical and realistic responses to the needs.
2. The programs started small, with one school piloting most program components. Based on this experience, changes were made and programs were initiated in the three other high schools.
3. Teachers and guidance counselors were involved in creating a comprehensive program and understood that its implementation was integral to their job. This involvement was critical to integrating the project permanently into the school system.

The School/Business Pairing Project, by dividing the responsibility for coordination among businesses, school staff, the Center for School-Business Initiatives, and the Boy Scouts of America, has made the programs manageable and sustainable. The use of large host companies as resource networkers for individual schools has had several advantages:

1. Businesses more successfully attract business participation than do school people.
2. Small businesses are willing to become involved in short term projects that do not require sustained time and personnel commitments.

A particular strength of the Worcester project is its attention to sequential development and preparation. The schools have attempted to design career education experiences that reflect a developmental progression that matches all students' needs. Also, program planners have continually emphasized the preparation of both students and presenters in their programs to maximize their effectiveness and the participants' satisfaction with the results. The success of the project thus far has stimulated discussion about extending the scope of the career awareness programs to include the 7th grade and additional school staff.

APPENDIX A

A MODEL FOR SUCCESSFUL INDUSTRY EDUCATION PARTNERSHIPS

Industry-Education Partnerships at the most simple level are relationships between two parties, schools and businesses.

Schools ⟷ Businesses

These parties have a belief in the value of working together to achieve their common goals and a vision of what beneficial outcomes the partnership can produce.

Values
Schools ⟷ Businesses
Vision

Successful relationships require that the partners put in the time and energy that allows them to come to know and trust each other. These partnerships also demonstrate the following elements:

Commitment to the partnership goals: All of the partners at all levels in their organizations are committed to making the partnership work and willing to dedicate the required human and physical resources.

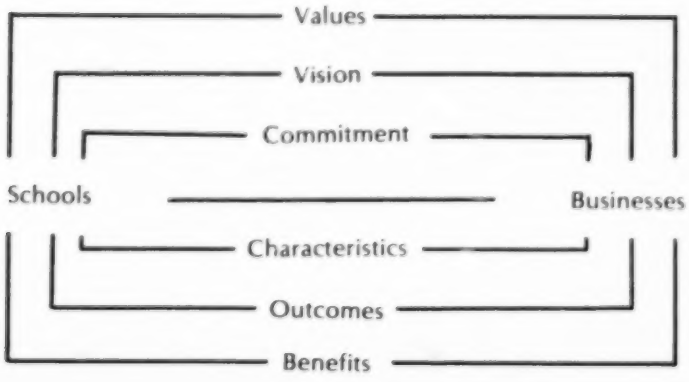
Understanding of the **characteristics** of the partnership: Partners are familiar with how the partnership is organized and coordinated, the channels of communication, and the role of any advisory boards.

Agreement on the **outcomes** of the partnership: The partners must know "what business they are in" and what the partnership can be expected to accomplish.

Ability to articulate the **benefits** that the partners derive: The partners are able to express their "bottom line," whether in long or short range terms. These benefits will vary among partners and be as diverse as skill development for students and an upgraded public image for the company. In communicating the benefits they derive from the partnership, partners help others to understand their motivation for involvement.

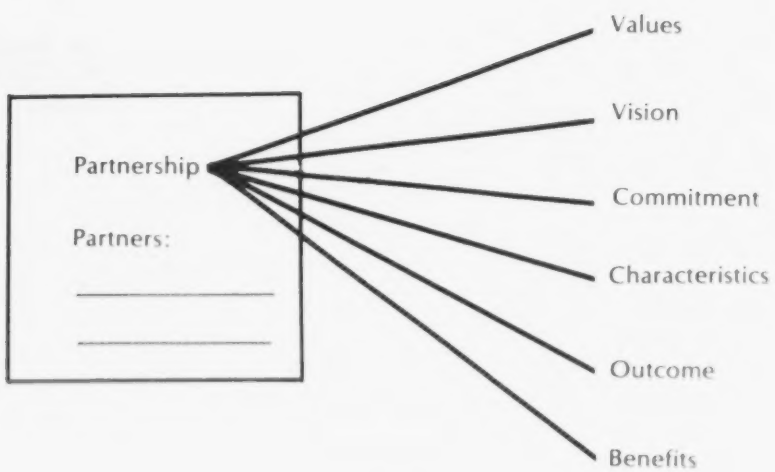
These elements can be described as part of an ongoing process that contributes to the success of the partnership (Diagram A):

Elements in a Successful Partnership
(Diagram A)



These elements can also be considered TOOLS that help the partners INITIATE, DEVELOP, REDIRECT, EVALUATE, AND DESCRIBE the partnership (Diagram B):

A Model for Effective Partnership *(C)
(Diagram B)



By filling in the blanks next to the elements with "who," "where," "what," "why," and "when" as appropriate, partnerships can be planned, described, expanded or evaluated. This simple tool has proven a useful device for organizing the information about a partnership into a system that addresses its basic elements.

*(C) 1986 Extended Committee for Industry-Education Partnerships of the Massachusetts Community Education Advisory Council, which provides guidance and recommendations to the Massachusetts Board of Education.

For more information on using this model as a tool for initiating or strengthening partnerships, contact:

Susan Freedman, Coordinator of Community Education
Bureau of Student, Community and Adult Services
1385 Hancock Street
Quincy, MA 02169
(617) 770-7381

APPENDIX B:
RESOURCES FOR PARTNERSHIPS

There are many excellent written and organizational resources that provide useful and creative suggestions for industry-education partnership programming and for initiating and managing partnerships. The following lists present a wide variety of partnership models and strategies that others have found successful. If related materials or organizations of which you are aware are not included here, kindly share that information with us by writing to:

Susan Freedman
Coordinator of Community Education
Bureau of Student, Community and Adult Services
1385 Hancock Street
Quincy, MA 02169

I. Publications

Investing in our Children: Business and the Public Schools. Committee for Economic Development, 477 Madison Avenue, NY, NY 10022. A 1985 publication that presents the case for business involvement in the schools.

Let's Not Reinvent the Wheel: Profiles of School-Business Collaboration. Ian McNett (Ed.), Washington, D.C., Tilden Press, 1982. This publication of the Institute for Educational Leadership provides a comprehensive introduction to partnerships.

Business-School Partnerships: A Plus for Kids. A 1980 publication of the National School Public Relations Association, 1801 N. Moore Street, Arlington, VA 22209.

Partners for the 80's: Business and Education. A 1980 publication of the National School Volunteer Program, 300 N. Washington Street, Alexandria, Virginia 22314. This is a brief account of nationwide school-business partnerships that are focused at the K-12 level.

Community Education/Work Collaboration: A Massachusetts Perspective. Richard A. Sockol and Thomas W. McClain, University of Massachusetts: Institute for Governmental Services, 1978. This publication briefly documents 12 varied education-business programs in Massachusetts and attempts to draw some conclusions.

School/Business Partnerships: A Practitioners Guide. Richard A. Sockol and Thomas W. McClain, University of Massachusetts:Institute for Governmental Services, 1978. This publication examines the Tri-Lateral Council for Quality Education, in Boston, as an example of a program that pairs large businesses and schools in a one-to-one relationship.

Creating School-Business Partnerships. Massachusetts Department of Education, 1983. Case studies and profiles on a range of school-business partnerships in Massachusetts.

Proceedings of the 1984 "Partners for Excellence" Conferences. Massachusetts Department of Education. Contains profiles of 17 partnerships and many strategies for initiating and maintaining partnerships.

Industry-Education Partnership Guidelines. Massachusetts Department of Education, 1985. A step-by-step guide to initiating and maintaining a school-business partnership.

Hip Pocket Guide to Planning and Evaluation. Dorothy B. Craig, 1978, University Associates, Inc., P.O. Box 26240, San Diego, CA 92126. A comprehensive and readable guide to evaluation.

Company-School Collaboration: A Manual for Developing Successful Projects. Education Services, American Council of Life Insurance, 1850 K Street, NW, Washington. D.C. 20006. A complete and valuable guide to partnership development.

Business and Education: Partners for the Future. Chamber of Commerce of the United States, 1615 H. Street, NW, Washington, D.C., 1985. An introduction to industry-education partnerships.

A Sure Bet: Business and Education Together. A Handbook for Chamber of Commerce Education Committees, February, 1985, Education Department, California Chamber of Commerce, P.O. Box 1736,

Sacramento, CA 95808. Practical suggestions for initiating and developing partnership programs, with an emphasis on the role of Chambers of Commerce.

Partnerships in Education: A Handbook. Pennsylvania Department of Education, Office of Basic Education, 333 Market Street, Harrisburg, PA 17108. A step-by-step guide to initiating partnerships.

The NAB Publication List. National Alliance of Business, 1015 15th Street, NW, Washington, D.C. 20005. A listing of NAB materials, including many titles on industry-education partnerships.

Public Relations Tools for School Volunteers. Marilyn Wimer, National School Volunteers Program, 701 N. Fairfax Street, Suite 320, Alexandria, VA 23314. Many useful suggestions for public relations that are applicable to all partnerships.

The Report of the Governor's Task Force on Private Sector Initiatives. Commonwealth of Massachusetts, 1983. Available through the Lincoln Filene Center for Citizenship and Public Affairs, Tufts University, Medford, MA 02155. A comprehensive listing of resources in Massachusetts.

II. Organizational Resources

American Newspaper Publishers Association Foundation. The ANPA promotes Newspapers in Education (NIE) programs across the country. The Foundation develops and disseminates curriculum materials for schools, publishes a bibliography of its teacher guides, and holds training in the use of the newspaper as a learning tool for teachers and local NIE coordinators. The following offices can be contacted for further information:

American Newspaper Publishers Association Foundation
The Newspaper Center, Box 17407
Dulles International Airport
Washington, D.C. 20041
(703) 620-9500

Massachusetts Newspaper in Education Council
13 Temple Street
Quincy, MA 02169
(617) 786-7254

The ANPA Bibliography of NIE publications is available by contacting:

NIE Information Service
R. C. Anderson Associates
44 Rosewood Drive
Pittsford, New York 14534

Boy Scouts of America. The Career Awareness Exploring program of the Boy Scouts of America provides a vehicle for the Scouts and schools to collaborate on career awareness programs at the high school level. For further information, contact:

National Office
Boy Scouts of America
1325 Walnut Hill Lane
Irving, Texas 75062-1296

Chambers of Commerce. These local level organizations are supported by the U.S. Chamber of Commerce in their efforts to foster school-business partnerships. Films and resource materials are available. For further information contact:

Chamber of Commerce of the United States
165 H Street NW
Washington, D.C. 20006

The Citizen's Forum on Self-Government operates a computer-based Information and Referral Service, CIVITEX, which contains thousands of examples of local problem-solving projects that utilize partnerships. For information, contact:

CIVITEX-Citizen's Forum on Self-Government
National Municipal League, Inc.
55 West 44th Street
New York, New York 10036
Toll Free No. (800) 223-6004

The Education Commission of the States. This Commission grew out of the President's National Task Force on Education for Economic Growth and will continue the task force's work. It is chaired by Governor James Hart of North Carolina. For additional information contact:

Dr. Robert Andringe
Executive Director of ECS
1860 Lincoln Street, Suite 300
Denver, Colorado 80295
(303) 830-3620

National Alliance of Business (NAB). This organization has long been involved in the support and promotion of industry-education cooperation. Its mission is to increase private sector support, training, and job opportunities for the economically disadvantaged and the long term unemployed. For more information:

National Alliance of Business
1015 15th Street
Washington, D.C. 20005
(202) 457-0040

National Association for Industry-Education Cooperation (NAIEC). This organization, founded in 1964 by a coalition of industry people and educators, was developed to help big business and schools work together to improve the quality of education at all grade levels. Developing local Industry-Education Councils has been a key programmatic development of NAIEC. Some of its publications include:

A Handbook: How to Plan a Community Resources Workshop.
A Handbook: Industry Education Councils.
A Guide for Evaluating Industry-Sponsored Educational Materials.

For these publications and more information, contact:

National Association for Industry-Education Cooperation
235 Hendrick Boulevard
Buffalo, New York 14226
(716) 833-6346 or 846-4191

National Institute for Work and Learning (NIWL). This Institute is the former **National Manpower Institute** (NMI), founded in 1971 by Willard Wirtz. This organization has founded a major research project called the Industry-Education-Labor Collaboration Project and has produced numerous publications on this related topic, including the following:

Industry-Education-Labor Collaboration: An Action Guide for Collaborative Councils
Industry-Education-Labor Collaboration: Policies and Practices in Perspective

Northeast Industry Education Labor Alliance. This organization represents the northeastern states and is an affiliate of NAIEC. It focuses on the establishment of public/private sector cooperation to deal with issues such as long range economic integrity and better relationships between education and economic development. It publishes a newsletter, "News: The Northeast Review," and co-sponsors conferences to address pertinent issues. For more information contact:

Northeast Industry Education Labor Alliance
P.O. Box 2203
Springfield, MA 01101
(413) 781-1185

Private Industry Councils (PICS). These local organizations are mandated by the Job Training Partnership Act (JTPA). They are often involved in training and preparation programs that assist the school-to-work transition.

III. Other Resources

Channel One. A national model based on the "Gloucester Experiment," a program begun in 1970 which involved businesses, the community and schools in the creation of an experiential educational program for youth. The twin focus of the program was to address social problems and to foster community development. Channel One, as it is now called, has been expanded and has similar programs operating across the nation. *A Facilitator's Guide to Channel One Programming* and other information are available as follows:

The Channel One Clearinghouse Corporation
Box 8, Lanesville Station
Gloucester, Massachusetts 10930

Jobs for America's Graduates (JAG). A comprehensive program to help with the school to work transition. A model program was implemented in Delaware in 1980 and is now duplicated in Massachusetts, Missouri, and Tennessee. For more information, contact:

Jobs for America's Graduates
Suite 304, 1750 Pennsylvania Avenue, N.W.
Washington, D.C. 20006
(202) 638-2958

In Massachusetts, the program is called *Jobs for Bay State Graduates* and operates in 23 high schools. For further information, contact:

Jobs for Bay State Graduates, Inc.
Lawrence G. Fitch, Director
100 Federal Street, 17th Floor
Boston, MA 02110

Junior Achievement. Junior Achievement, Inc., 550 Summer Street, Stamford, Conn. 06902. Junior Achievement sponsors programs for high school students which give students experience in operating their own small businesses. It also has developed Applied Economics, a computer based course for high school students and Project Business, which brings business executives into eighth and ninth grade classrooms to teach an economics curriculum.

Pro-Education, P.O. Box 41570, St. Petersburg, Florida 33743. This magazine, which is published quarterly, focuses on partnerships with education and provides timely information on a wide range of partnership resources.

Project BICEP (Barnstable Instruction Career Education Program). Project BICEP, which has been adopted by several schools in Massachusetts, is an elementary school career awareness project, funded by Title IV-C, which provides instructional activities focusing on self-awareness, interpersonal skills, attitudes toward work, decision-making, problem solving, occupational awareness, and economic awareness. Project BICEP utilizes community resources such as parents, business leaders, and retired citizens in its varied activities. For more information contact:

Patricia Duffy, Program Director
Project BICEP
Barnstable School System
Hyannis, Massachusetts 02601
(617) 771-1721

Project Share. This national clearinghouse for improving the management of human services provides resource information on a wide range of topics and publishes a newsletter, "Sharing." For more information, contact:

Project Share
P.O. Box 2309
Rockville, Maryland 20852

Volunteer: The National Center for Citizen Involvement. This organization provides information on volunteer efforts across the nation and publishes a newsletter, "Volunteering." For more information, contact:

Volunteer
P.O. Box 4179
Boulder, Colorado 80306

Massachusetts Department of Education

CENTRAL MASSACHUSETTS REGIONAL EDUCATION CENTER
Beaman Street, Route 140
West Boylston, Massachusetts 01583
(617) 835-6266

GREATER BOSTON REGIONAL EDUCATION CENTER
74 Acton Street
Arlington, Massachusetts 02174
(617) 641-4870

NORTHEAST REGIONAL EDUCATION CENTER
219 North Street
North Reading, Massachusetts 01864
(617) 664-5723

NORTHWEST REGIONAL EDUCATION CENTER
Mark Hopkins Hall
Church Street
North Adams, Massachusetts 01247
(413) 664-4511, Ext. 392

SOUTHEAST REGIONAL EDUCATION CENTER
P.O. Box 29
Middleboro, Massachusetts 02346
(617) 947-1231

GREATER SPRINGFIELD REGIONAL EDUCATION CENTER
88 Massasoit Avenue
West Springfield, Massachusetts 01089-1199
(413) 739-7271